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No. 2291

United States

Circuit Court of Appeals

For the Ninth Circuit.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,,

Appellee,

And

ARIZONA COPPER COMPANY, a Corporation,

Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,,

Appellee.

Transcript of Record.

Upon Appeal from the United States District Court for the District of Arizona.

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Records of U. S. Circuit Court of Appeals

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INDEX OF PRINTED TRANSCRIPT OF RECORD.

[Clerk's Note: When deemed likely to be of an important nature, errors or doubtful matters appearing in the original certified record are printed literally in italic; and, likewise, cancelled matter appearing in the original certified record is printed and cancelled herein accordingly. When possible, an omission from the text is indicated by printing in italic the two words between which the omission seems to occur. Title heads inserted by the Clerk are enclosed within brackets.]

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[1*] *In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.*

No. 20A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Bill of Complaint [of Mine and Smelter Supply Co. Against Detroit Copper Mining Co.].

THE MINE AND SMELTER SUPPLY COMPANY, a corporation duly organized and existing under and by virtue of the general incorporation laws of, and doing business in the State of Colorado, and having its principal office and place of business in the City and County of Denver in said State, brings this BILL OF COMPLAINT against the DETROIT COPPER MINING COMPANY OF ARIZONA, a corporation organized and existing under and by virtue of the general incorporation laws of, and doing business in the Territory of Arizona at Morenci, in the County of Graham in said Territory; and thereupon your orator complains and shows unto your Honor:

*Page-number appearing at top of page of original certified Record.

I.

That heretofore, to wit, prior to March 16th, A. D. 1897, Arthur R. Wilfley, who then was, ever since has been, and now is [2] a citizen of the United States and of the State of Colorado residing in and an inhabitant of the City and County of Denver in said State, was the original, first and sole inventor of a certain new and useful improvement in ore concentrators; that the same was a new and useful invention, and was not known to or used by others in the United States, and was not patented or described in any printed publication in the United States, or any foreign country, before the said Arthur R. Wilfley's invention or discovery thereof, and the same was not in public use or on sale for more than two years prior to the application of the said Arthur R. Wilfley for United States letters patent therefor, and that the same has never been abandoned; a more particular description of which invention will be found in the United States letters patent hereinafter referred to.

II.

That the said Arthur R. Wilfley, so being the original, first and sole inventor of said improvements, heretofore, to wit, on the 16th day of March, A. D. 1897, made application in writing, in due form of law, to the United States Commissioner of Patents, in accordance with the provisions of the then existing laws of the United States in such case made and provided, for letters patent of the United States for his said invention, and in respect thereto complied with all the conditions and requirements of said laws,

and of the rules of practice of the United States Patent Office in such case made [3] and provided.

III.

That all the requirements of the laws and of the rules of practice of the United States Patent Office in such case made and provided, having been fully complied with by the said Arthur R. Wilfley as aforesaid, and upon due proceedings had in said Patent Office of the United States in full accordance therewith, relating to the granting and issuance of United States letters patent for inventions, and after due examination made by the United States Commissioner of Patents, as to the novelty and patentability of the said invention as required by law, and the aforesaid invention and improvements in ore concentrators having been found by the Commissioner of Patents to be novel and patentable under and in accordance with the said laws and the rules of practice of the said United States Patent Office, thereafter, to wit, on September 28th, A. D. 1897, letters patent of the United States, bearing the date last aforesaid, Numbered 590,675, signed, sealed and executed in due form of law, were granted, issued and delivered by the United States Commissioner of Patents to the said Arthur R. Wilfley, his heirs, legal representatives and assigns, under the seal of the Patent Office of the United States, signed by the Assistant Secretary of the Interior, and countersigned by the said Commissioner of Patents, whereby there was granted and secured to the said Arthur R. Wilfley, his heirs and [4] assigns, for the full term of seventeen (17) years from and after said

last named date, to wit, September 28th, A. D. 1897, the sole and exclusive right, liberty and privilege to make, use and vend the said invention throughout the United States of America and the Territories thereof, as by said original letters patent No. 590,675, or a duly certified copy thereof, here in court to be produced as may be required, will more fully and at large appear.

IV.

That thereafter, on to wit, the 12th day of October, A. D. 1905, by his assignment in writing, duly executed and acknowledged, and bearing the date last aforesaid, the said Arthur R. Wilfley, for a good and valuable consideration, did sell, assign, transfer and convey unto your orator, said The Mine and Smelter Supply Company, its successors and assigns, the whole right, and all his right, title and interest in and to his invention and improvements in ore concentrators, and in and to the said Letters Patent No. 590,675, which said assignment in writing was duly recorded in Liber B, 73, at page 254, of Transfers of Patents in the Patent Office of the United States, on the 29th day of November, A. D. 1905; and ever since the said purchase by and transfer of the same to your orator as aforesaid, it has been and now is the sole and exclusive owner of the patented improvement and invention, of the said United States letters patent so granted therefor as aforesaid, and of all and singular the rights and privileges granted and intended to be [5] granted by the said letters patent; as by the original of said assignment in writing, or a duly certified copy of the said record

thereof, here in court to be produced as may be required, will more fully and at large appear.

V.

That since the grant, issuance and delivery of said United States letters patent No. 590,675 to the said Arthur R. Wilfley as aforesaid, the improvement in ore concentrators therein set forth, described and claimed, has gone into great and extensive use, and has displaced and superseded to a very great extent all other apparatus and means for ore dressing by concentration designed for said purpose, and except as hereinafter alleged and set forth, the aforesaid exclusive rights and privileges of your orator, and of its said assignor, have been acknowledged and acquiesced in by all persons, firms and corporations using the type of ore dressing apparatus, or ore concentrators using said type of ore-concentrating apparatus, and upwards of twelve thousand (12000) of said patented improvements in ore concentrators have been manufactured, sold and installed, and a world-wide market and demand created therefor by your orator at great expense and large sums of money have been expended by your orator in construction and equipment of a plant for the manufacture thereof and in building up markets therefor, and the exclusive right and privileges granted as aforesaid and secured to your orator by virtue of its ownership of the said letters patent No. 590,675 aforesaid, are of great utility [6] and of great and incalculable value to your orator, and have been and are of great benefit and advantage over other apparatus in the concentration of ores bearing gold, silver, lead and

other metals; and but for the hereinafter set forth wrongful and unlawful acts of the defendant, your orator would have heretofore, and would now enjoy the exclusive right and liberty of making and vending to others to be used, and licensing others to use, ore concentrators embodying and containing said patented invention and improvement, and would have derived and secured, and would now derive and secure great profits and advantages therefrom, and from the manufacture, sale and use of said apparatus and machines, of which the said wrongful and unlawful acts of the said defendant, herein complained of, have deprived and are now depriving your orator.

VI.

That the said defendant has at all times subsequent to the 12th day of January, A. D. 1910, had personal notice and knowledge of the grant and issue of the said letters patent, and of the rights of your orator thereunder and thereto, and was duly notified of the infringement hereinafter complained of, and has continued after such notice, to wit, from and after the 12th day of January, A. D. 1910, to use and operate the infringing devices hereinafter complained of and described.

[7] VII.

And your orator further represents and shows unto your Honor: That heretofore, to wit, on July 17th, A. D. 1899, the said Arthur R. Wilfley, to whom the said United States letters patent No. 590,675 were granted as aforesaid, the said Arthur R. Wilfley being then and there the owner of said letters patent and entitled to the benefits and protec-

tion thereof, with respect to his said invention therein described and claimed, filed his Bill of Complaint, in Equity, in the United States Circuit Court, within and for the District and State of Colorado, against the Denver Engineering Works Company, a corporation organized under and pursuant to the provisions of the general incorporation laws of the State of Colorado, having its principal office and place of business in the City of Denver, in said State, and Ira A. Cammett and Frank E. Shepard, in a certain cause docketed in said court as Cause No. 3927, in equity, alleging an infringement by the said defendants in the said cause of said letters patent No. 590,675, by the manufacture, advertisement and offer for sale and use, and the sale for use and use of a certain mechanical combination or apparatus called by them the "Cammett Concentrating Table" or the "Cammett Concentrator," which embodied and contained the said invention set forth, described and claimed in the said United States letters patent No. 590,675 aforesaid; that thereafter the said defendants answered to the said bill of complaint in said suit and put in issue, *inter alia,* the validity of your orator's said United States letters [8] patent, and as well the alleged infringement thereof; and the said Arthur R. Wilfley, complainant in said cause, filed his general replication thereto; and the said cause thereupon being at issue, voluminous proofs were taken by depositions in said cause, as well on behalf of the defendants as on behalf of the complainant in said cause; and thereafter, and at the May, A. D. 1901 Term of said Court, the said suit in

equity was heard by and before said court, the Honorable John A. Riner presiding, at a full and final hearing upon the issues as made up as aforesaid and proofs of the respective parties, and the same was duly and fully argued by counsel for the respective parties; and afterwards, on due consideration thereof by the said Court, the same having been taken under advisement, on, to wit, the 5th day of November, A. D. 1901, the said United States Circuit Court, within and for the Eighth Judicial Circuit of the United States, and the District and State of Colorado, by said the Honorable John A. Riner, District Judge, then and there presiding, did order and direct a decree in favor of the said complainant in said cause, and ordering, adjudging and decreeing that the said United States letters patent No. 590,675 were and are good and valid in law, and were infringed by the devices manufactured, sold and used by the said defendants; and thereafter, to wit, on said 5th day of November, A. D. 1901, a decree was duly signed by said the Honorable John A. Riner, District Judge, presiding in said court, and filed in said court, wherein and whereby said court ordered, adjudged and decreed that the said letters patent [9] No. 590,675 were and are good and valid in law, and were infringed by the devices manufactured, sold and used by the said defendants in said cause; and ordered, adjudged and decreed that a permanent writ of injunction issue out of and under the seal of said court, enjoining and restraining the said defendants, and each of them, from directly or indirectly making, selling or using in any manner any ore con-

centrator or apparatus containing, embodying or employing the invention secured by the said United States letters patent No. 590,675 aforesaid, all as more fully and at large will appear from the said original decree or a duly certified copy thereof ready here in this court to be produced as may be required; that no appeal has ever been taken from said decree, nor has said decree ever been set aside, vacated or held for naught, but has ever since the entry thereof in said cause continued to be in full force and effect, all of which will be made more fully and at large to appear by the pleadings, files, records and proceedings in the said cause, to which your orator hereby begs leave to refer, and the same or duly certified copies thereof to be produced here in court as may be required.

VIII.

Yet notwithstanding which, and all and singular the matters and things hereinbefore set forth and shown unto your Honor, since the grant, issuance and delivery of the said United States letters patent No. 590,675 to the said Arthur R. Wilfley, and since the transfer thereof as aforesaid to your orator, and [10] during the time that your orator has been the sole and exclusive owner of the said Letters Patent, has had the sole and exclusive right of enjoyment of the exclusive rights and privileges granted thereby, and the sole and exclusive right, liberty and privilege to manufacture, vend and use, and to license others to use, the said patented invention and improvements in ore concentrators therein set forth, described and claimed, and after your

orator had at great expense built up and secured for itself a market and demand for the said patented invention and improvements, and invested large sums of money in and for the manufacture of machines and apparatus embodying the said patented invention and improvements, and after your orator had at great cost and expense demonstrated the utility and efficiency of the said machines and apparatus in the dressing and concentration of ores containing gold, silver, copper, lead and other metals, and the superiority thereof over other means previously in use for that purpose, and had to a very great extent supplanted other apparatus, machines and means previously used for the purpose, not only in the United States and the Territories thereof, but throughout the mining sections of the entire world, the said defendant, well knowing the premises, and having full knowledge and notice of the rights of your orator, and without the license or authority of your orator, and in violation of the exclusive rights and privileges granted [11] and secured to your orator by the said United States letters patent No. 590,675 aforesaid, since your orator has become and during the time your orator has been the sole and exclusive owner of said letters patent, and of the invention and improvements in ore concentrators therein set forth, described and claimed, and entitled to the sole and exclusive enjoyment of the rights and privileges guaranteed thereby, did, at some time prior to the 1st day of January, A. D. 1910, the exact time being unknown to your orator, within the Territory of Arizona, purchase of and from one Emil Deister, or

from the Deister Concentrator Company, both of Fort Wayne, State of Indiana, and the said Emil Deister or the Deister Concentrator Company, or both, did sell to the said defendant, through agencies and interventions unknown to your orator, eight (8) ore concentrators or ore concentrating tables, which are called by the said defendant, and said Emil Deister and said The Deister Concentrator Company, and are known as "Deister Concentrators," containing and embodying the invention and improvements set forth, described and claimed in the said United States letters patent No. 590,675 aforesaid; and thereafter the same were delivered and installed in a mill owned and operated by said defendant at Morenci, Graham County, Territory of Arizona, and thereafter the same were used, and continuously ever since and still are being used in the concentration of ores by said defendant at the place aforesaid, with certain [12] riffles upon the tops or concentrating surfaces thereof, which in their construction, adjustment and arrangement upon said table surfaces substantially embody and contain the improvements and invention so patented to the said Arthur R. Wilfley as aforesaid by said hereinbefore described letters patent No. 590,675 now owned by your orator as aforesaid, and especially the improvements covered and protected by the first, second and seventh claims of said letters patent.

IX.

That the said defendant has ever since the purchase and installation of said so-called "Deister Concentrators" in its mill aforesaid, persisted in

using said patented improvements and in operating the said so-called "Deister Concentrators" in its said mill at Morenci, and in Graham County, Territory of Arizona, in the concentration of ores, and, as your orator is informed and verily believes, and upon information and belief alleges, by and with the promise and assurance of protection in such use and operation from and by the said Emil Deister or said The Deister Concentrator Company, or both; and your orator is informed and verily believes, and upon information and belief alleges, that the said defendant intends to continue the perpetration of said infringements upon the rights secured to your orator by said letters patent No. 590,675 aforesaid, and though warned by your orator to desist therefrom, said defendant threatens to continue the use and operation of said so-called "Deister Concentrators" as aforesaid, and **[13]** your orator fears and verily believes that the said defendant will, in future, continue to so infringe upon the exclusive rights secured to your orator as aforesaid by the use and operation of said so-called "Deister Concentrators" so infringing the letters patent of your orator as aforesaid; that by reason of the said violations and infringements of the said exclusive rights of your orator in and to the inventions and improvements in ore concentrators set forth, described and claimed in the United States letters patent No. 590,675 aforesaid by the said defendant, your orator has been, and is being deprived of large profits, benefits and advantages which might and otherwise would accrue to your orator, and the said defendant

has been and is now enjoying large profits, benefits and advantages from the practice of the said infringements which should accrue to your orator; and your orator avers, that the said wrongful and unlawful acts of infringement so practiced by the said defendant as aforesaid have caused and are causing your orator great and irreparable damage and injury, and that the damages so accruing to your orator by reason thereof are extremely difficult, if not quite impossible of definite ascertainment, by reason of the great variety and range of efficiency of numerous other means, machines and apparatus known to the art and used in the practice of ore dressing, in the treatment of ores of various composition and complexity; and your orator avers, that by reason of the premises your orator has no adequate [14] remedy at law in an action for damages by reason of the practice of the said infringements by the said defendant; and your orator alleges upon information and belief, that the profits of which your orator has been deprived, and which have accrued to the said defendant, and the damages which have been suffered by your orator by the wrongful and unlawful infringing acts of the said defendant herein complained of, amount to the sum of Ten Thousand Dollars ($10,000.00).

That for the wrongs and injuries herein complained of your orator has no plain, speedy or adequate remedy at law, and forasmuch as your orator is without remedy save in a court of equity where matters of this kind are properly cognizable and relievable.

To the end, therefore, that the said defendant may, if it can, show why your orator should not have the relief herein prayed, and may, according to the best and utmost of its knowledge, remembrance, information and belief, full, true, direct and perfect answer make to all and singular the matters hereinbefore stated and charged, but not under oath, answer under oath being hereby expressly waived.

And your orator further prays, that the said defendant may be decreed to account for and pay over unto your orator all gains and profits thus unlawfully derived from the infringement and violation of your orator's said letters patent No. 590,675 and of all of your orator's rights thereunder; and the **[15]** damages sustained by your orator by reason of such violation and infringement of said rights or letters patent, your orator prays that your Honor may grant a writ of injunction, issuing out of and under the seal of this Honorable Court, perpetually enjoining and restraining the said defendant, its agents, attorneys, servants, employees, workmen and associates, and each and every of them, from any further use and operation in any manner of your orator's said inventions and improvements covered, described and claimed in the said letters patent aforesaid, or any part thereof, in violation of your orator's rights as aforesaid; and that your Honor, upon rendering the decree above prayed, may assess, or cause to be assessed, in addition to the gains and profits to be accounted for as aforesaid, the damages your orator has sustained by reason of said infringements, and that your Honor may increase the actual

damages so assessed to a sum three times the amount of such assessment under the circumstances of the wilful and unjust infringements of said defendant as herein set forth; and your orator further prays that a provisional or preliminary injunction be issued out of and under the seal of this Honorable Court enjoining and restraining the said defendant, its agents, attorneys, servants, employees, workmen and associates, and each and every of them during the pendency of this suit, from any further infringement of said letters patent No. 590,675 and of all of your orator's rights thereunder, and from continuing **[16]** the use and operation of said patented inventions and improvements; and your orator further prays that the ore concentrators or ore concentrating tables or apparatus now in the possession of or under the control of the said defendant and infringing the rights and letters patent of your orator as aforesaid, and each and every of them, may be destroyed under the orders of this court; and for such other and further relief as the equity of the case may require and to your Honor may seem meet.

May it please your Honor to grant unto your orator not only a writ of injunction conformable to the prayer of this Bill of Complaint, but also a writ of subpoena of the United States of America, directed to the said defendant, commanding it on a day certain to appear and answer unto this Bill of Complaint, and abide and perform such order and decree in the premises as the Court may deem proper and

be required by the principles of equity and good conscience.

And your orator will ever pray, etc.

Dated this 18th day of February, A. D. 1910.

THE MINE AND SMELTER SUPPLY COMPANY.

By A. H. SEEP,
Vice-President.

FREDRICK S. NAVE,
Solicitor for Complainant.

GEO. L. HODGES.
D. EDGAR WILSON.
Of Counsel for Complainant,
603–7 Ernest & Chanmer Bldg.
Denver, Colorado.

[17] State of Colorado,
City and County of Denver,—ss.

A. H. Seep, being first duly sworn, on his oath deposes and says: That he is the Vice-President of The Mine and Smelter Supply Company, a corporation, and the complainant named in the above and foregoing Bill of Complaint; that he has read the said Bill of Complaint and knows the contents thereof, and that the matters and things therein stated are true of his own knowledge, except as to those matters and things as are therein stated to be made upon information and belief, and as to such matters and things he verily believes the same to be true.

A. H. SEEP.

Subscribed and sworn to before me, this 18th day of February A. D. 1910.

My Commission expires February 23rd, 1911.

HORACE U. KENNEDY,
Notary Public.

[Endorsements]: No. 11 (1). In Equity. United States of America. Territory of Arizona. The Mine & Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company, of Arizona, a Corporation, Defendant. Bill of Complaint. Filed at 11:30 A. M., February 24, 1910. George H. Smalley, Clerk. Filed March 13, [18] 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

21A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,
Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,
Defendant.

Bill of Complaint [of Mine and Smelter Supply Co. Against Arizona Copper Co.].

THE MINE AND SMELTER SUPPLY COM-

PANY, a corporation duly organized and existing under and by virtue of the general incorporation laws of, and doing business in the State of Colorado, and having its principal office and place of business in the City and County of Denver in said State, brings this Bill of Complaint against the ARIZONA COPPER COMPANY, a corporation organized and existing under and by virtue of the general incorporation laws of, and doing business in the County of Graham in the Territory of Arizona; and thereupon your orator complains and shows unto your Honor:

I.

That heretofore, to wit, prior to March 16th, A. D. 1897, Arthur R. Wilfley, who then was, ever since has been, and now is a citizen of the United States and of the State of Colorado, [19] residing in and an inhabitant of the City and County of Denver in said State, was the original, first and sole inventor of a certain new and useful improvement in ore concentrators; that the same was a new and useful invention, and was not known to or used by others in the United States, and was not patented or described in any printed publication in the United States, or any foreign country, before the said Arthur R. Wilfley's invention or discovery thereof, and the same was not in public use or on sale for more than two years prior to the application of the said Arthur R. Wilfley for United States Letters Patent therefor, and that the same has never been abandoned; a more particular description of which invention will be found in the

United States Letters Patent hereinafter referred to.

II.

That the said Arthur R. Wilfley, so being the original, first and sole inventor of said improvements, heretofore, to wit: on the 16th day of March A. D. 1897, made application in writing, in due form of law, to the United States Commissioner of Patents, in accordance with the provisions of the then existing laws of the United States in such case made and provided, for Letters Patent of the United States for his said invention, and in respect thereto complied with all the conditions and requirements of said laws, and of the rules of practice of the United States Patent Office in such case made and provided.

III.

That all the requirements of the laws and of the rules of practice [20] of the United States Patent Office in such case made and provided, having been fully complied with by the said Arthur R. Wilfley as aforesaid, and upon due proceedings had in said Patent Office of the United States in full accordance therewith, relating to the granting and issuance of United States letters patent for inventions, and after due examination made by the United States Commissioner of Patents, as to the novelty and patentability of the said invention as required by law, and the aforesaid invention and improvements in ore concentrators having been found by the Commissioner of Patents to be novel and patentable under and in accordance with the said laws and the

rules of practice of the said United States Patent Office, thereafter, to wit, on September 28th, A. D. 1897, letters patent of the United States, bearing the date last aforesaid, Numbered 590,675, signed, sealed and executed in due form of law, were granted, issued and delivered by the United States Commissioner of Patents to the said Arthur R. Wilfley, his heirs, legal representatives and assigns, under the seal of the Patent Office of the United States, signed by the Assistant Secretary of the Interior, and countersigned by the said Commissioner of Patents, whereby there was granted and secured to the said Arthur R. Wilfley, his heirs and assigns, for the full term of seventeen (17) years from and after said last named date, to wit, September 28th, A. D. 1897, the sole and exclusive right, liberty and privilege to make, use and vend [21] the said invention throughout the United States of America and the Territories thereof, as by said original letters patent No. 590,675 or a duly certified copy thereof, here in court to be produced as may be required, will more fully and at large appear.

IV.

That thereafter, on, to wit, the 12th day of October, A. D. 1905, by his assignment in writing, duly executed and acknowledged, and bearing the date last aforesaid, the said Arthur B. Wilfley, for a good and valuable consideration, did sell, assign, transfer and convey unto your orator, said The Mine and Smelter Supply Company, its successors and assigns, the whole right, and all his right, title and interest in and to his invention and improve-

ments in ore concentrators, and in and to the said Letters Patent No. 590,675, which said assignment in writing was duly recorded in Liber B. 73, at page 254, of Transfers of Patents in the Patent Office of the United States, on the 29th day of November, A. D. 1905; and ever since the said purchase by and transfer of the same to your orator as aforesaid, it has been and now is the sole and exclusive owner of the patented improvement and invention, of the said United States letters patent so granted therefor as aforesaid, and of all and singular rights and privileges granted and intended to be granted by the said letters patent; as by the original of said assignment in writing, or a duly certified copy of the said record thereof, here in court to be produced as [22] may be required, will more fully and at large appear.

V.

That since the grant, issuance and delivery of said United States Patent No. 590,675, to the said Arthur R. Wilfley as aforesaid, the improvement in ore concentrators therein set forth, described and claimed, has gone into great and extensive use, and has displaced and superseded to a very great extent all other apparatus and means for ore dressing by concentration designed for said purpose, and except as hereinafter alleged and set forth, the aforesaid exclusive rights and privileges of your orator, and of its said assignor, have been acknowledged and acquiesced in by all persons, firms, and corporations using the type of ore-concentrating apparatus, and upwards of twelve thousand (12,000) of said patented improvements in ore concentrators have been manufactured,

sold and installed, and a world-wide market and demand created therefor by your orator at great expense, and large sums of money have been expended by your orator in construction and equipment of a plant for the manufacture thereof and in building up markets therefor, and the exclusive right and privileges granted as aforesaid and secured to your orator by virtue of its ownership of the said letters patent No. 590,675, aforesaid, are of great utility and of great and incalculable value to your orator, and have been and are of great benefit and [24] advantage over other apparatus in the concentration of ores bearing gold, silver, lead and other metals; and but for the hereinafter set forth wrongful and unlawful acts of the defendant your orator would have heretofore, and would now enjoy the exclusive right and liberty of making and vending to others to be used, and licensing others to use, ore concentrators embodying and containing said patented invention and improvement, and would have derived and secured, and would now derive and secure great profits and advantages therefrom, and from the manufacture, sale and use of said apparatus and machines, of which the said wrongful and unlawful acts of the said defendant, herein complained of, have deprived and are now depriving your orator.

VI.

That the said defendant has at all times subsequent to the 12th day of January, A. D. 1910, had personal notice and knowledge of the grant and issue of said letters patent, and of the rights of your orator thereunder and thereto, and was duly notified of the in-

fringement hereinafter complained of, and has continued after such notice, to wit, from and after the 12th day of January, A. D. 1910, to use and operate the infringing devices hereinafter complained of and described.

VII.

And your orator further represents and shows unto your Honor: That heretofore, to wit, on July 17th, A. D. 1899, the said [25] Arthur R. Wilfley, to whom the said United States letters patent No. 590,675, were granted as aforesaid, the said Arthur R. Wilfley being then and there the owner of said letters patent and entitled to the benefits and protection thereof, with respect to his said invention therein described and claimed, filed his bill of complaint, in equity, in the United States Circuit Court, within and for the District and State of Colorado, against the Denver Engineering Works Company, a corporation organized under and pursuant to the provisions of the general incorporation laws of the State of Colorado, having its principal office and place of business in the City of Denver, in said State, and Ira A. Cammett and Frank E. Shepard, in a certain cause docketed in said Court and Cause No. 3927, in equity, alleging an infringement by the said defendants in the said cause of said letters patent No. 390,675 by the manufacture, advertisement and offer for sale and use, and the sale for use and use of a certain mechanical combination or apparatus called by them the "Cammett Concentrating Table" or the "Cammett Concentrator," which embodied and contained the said invention set forth, described and claimed in the said

United States letters patent No. 590,675 aforesaid; that thereafter the said defendants answered to the said bill of complaint in said suit and put in issue, *inter alia,* the validity of your orator's said United States letter patent, and as well the alleged infringement thereof; and the said Arthur R. Wilfley, complainant in said [26] cause filed his general replication thereto and the said cause, thereupon being at issue, voluminous proofs were taken by depositions in said cause, as well on behalf of the defendants as on behalf of the complainant in said cause; and thereafter and at the May, A. D. 1901 Term of said Court, the said suit in equity was heard by and before said court, the Honorable John A. Riner presiding, at a full and final hearing upon the issues as made up as aforesaid and proofs of the respective parties, and the same was duly and fully argued by counsel for the respective parties; and afterwards, on due consideration thereof by the said court, the same having been taken under advisement on, to wit, the 5th day of November, A. D. 1901, the said United States Circuit Court, within and for the Eighth Judicial Circuit of the United States, and the District and State of Colorado, by said the Honorable John A. Riner, District Judge, then and there presiding, did order and direct a decree in favor of the said complainant in said cause, and ordering, adjudging and decreeing that the said United States letters patent No. 590,675 were and are good and valid in law, and were infringed by the devices manufactured, sold and used by the said defendants; and thereafter, to wit, on said 5th day of November, A. D. 1901, a decree was duly

signed by said the Honorable John A. Riner, District Judge, presiding in said court, and filed in said court, wherein and whereby said court ordered, adjudged and decreed that the said letters [27] were and are good and valid in law, and were infringed by the devices manufactured, sold and used by the said defendants in said cause; and ordered, adjudged and decreed that a permanent writ of injunction issue out of and under the seal of said court, enjoining and restraining the said defendants and each of them, from directly or indirectly making, selling or using in any manner any ore concentrator or apparatus containing, embodying or employing the invention secured by the said United States letters patent 590,-675 aforesaid, all as more fully and at large will appear from the said original decree or a duly certified copy thereof ready here in this court to be produced as may be required; that no appeal has ever been taken from said decree, nor has said decree ever been set aside, vacated or held for naught, but has ever since the entry thereof in said cause continued to be in full force and effect, all of which will be made more fully and at large to appear by the pleadings, files, records, and proceedings in the said cause, to which your orator hereby begs leave to refer, and the same or duly certified copies thereof to be produced here in court as may be required.

VIII.

Yet notwithstanding which, and all and singular the matters and things hereinbefore set forth and shown unto your Honor, since the grant, issuance and delivery of the said United States letters patent No.

590,675 to the said Arthur R. Wilfley, and since the transfer thereof as aforesaid to your orator, and during the time that your orator has been the sole and exclusive owner of the said letters patent, has had the sole and exclusive right of enjoyment of the exclusive rights and privileges granted thereby, and the sole and exclusive right, liberty and privilege to manufacture, vend and use, and to license others to use, the [28] said patented invention and improvements in ore concentrators therein set forth, described and claimed, and after your orator had at great expense built up and secured for itself a market and demand for the said patented invention and improvements, and invested large sums of money in and for the manufacture of machines and apparatus embodying the said patented invention and improvements, and after your orator had at great cost and expense demonstrated the utility and efficiency of the said machines and apparatus in the dressing and concentration of ores containing gold, silver, copper, lead, and other metals, and the superiority thereof over other means previously in use for that purpose, and had to a very great extent supplanted other apparatus, machines and means previously used for the purpose, not only in the United States and the Territories thereof, but throughout the mining sections of the entire world, the said defendant, well knowing the premises, and having full knowledge and notice of the rights of your orator in the premises, and against the will of your orator, and in violation of the exclusive rights and privileges granted and secured to your orator by the said United States letters patent No. 590,675

aforesaid, since your orator has become, and during the time your orator has been the sole and exclusive owner of said letters patent, and of the invention and improvements in ore concentrators therein set forth, described and claimed, and entitled to the sole and exclusive enjoyment of the rights and privileges guaranteed thereby, did, at some time prior to the 1st day of December, A. D. [29] 1909, the exact time being unknown to your orator, within the Territory of Arizona, purchase of and from one Emil Deister, or from the Deister Concentrator Company, both of Fort Wayne, State of Indiana, and the said Emil Deister or said the Deister Concentrator Company, or both, did sell to the said defendant, through agencies and interventions unknown to your orator, twelve (12) ore concentrators or ore concentrating tables, which are called by the said defendant, and said Emil Deister and said the Deister Concentrator Company, and are known as "Deister Concentrators," containing and embodying the invention and improvements set forth, described and claimed in the said United States letters patent No. 590,675 aforesaid; and thereafter the same were delivered and installed in a mill owned and operated by said defendant at Morenci, Graham County, Territory of Arizona, and thereafter the same were used, and continuously ever since and still are being used in the concentration of ores by said defendant at the place aforesaid, with certain riffles upon the tops or concentrating surfaces thereof, which in their construction, adjustment and arrangement upon said table surfaces substantially embody and contain the im-

provements and invention so patented to the said Arthur R. Wilfley as aforesaid by said hereinbefore described letters [30] patent No. 590,675, now owned by your orator as aforesaid, and especially the improvements covered and protected by the first, second, and seventh claims of said letters patent.

IX.

That the said defendant has ever since the purchase and installation of said so-called "Deister Concentrators" in its mill aforesaid, persisted in using said patented improvements and in operating the said so-called "Deister Concentrators" in its said mill at Morence, in Graham County, Territory of Arizona, in the concentration of ores, and, as your orator is informed and verily believes, and upon information and belief alleges, by and with the promise and assurance of protection in such use and operation from and by the said Emil Deister, or said The Deister Concentrator Company, or both; and your orator is informed and verily believes, and upon information and belief alleges, that the said defendant intends to continue the perpetration of said infringements upon the right secured to your orator by said letters patent No. 590,675 aforesaid, and though warned by your orator to desist therefrom, said defendant threatens to continue the use and operation of said so-called "Deister Concentrators" as aforesaid, and said defendant has advised your orator that it will continue so to do and that it has the right so to do, and your orator fears and verily believes that the said defendant will, in future, [31] continue to so infringe upon the exclusive rights secured to

your orator as aforesaid by the use and operation of said so-called "Deister Concentrators" so infringing the letters patent of your orator as aforesaid; that by reason of the said violations and infringements of the said exclusive rights of your orator in and to the inventions and improvements in ore concentrators set forth, described and claimed in the United States letters patent No. 590,675 aforesaid by the said defendant, your orator has been, and is being deprived of large profits, benefits and advantages which might and otherwise would accrue to your orator, and the said defendant has been and is now enjoying large profits, benefits and advantages from the practice of the said infringements which should accrue to your orator; and your orator avers, that the said wrongful and unlawful acts of infringement so practiced by the said defendant as aforesaid have caused and are causing your orator great and irreparable damage and injury, and that the damages so accruing to your orator by reason thereof are extremely difficult, if not quite impossible of definite ascertainment, by reason of the great variety and range of efficiency of numerous other means, machines and apparatus known to the art and used in the practice of ore dressing, in the treatment of ores of various composition and complexity; and your orator avers that by reason of the [32] premises your orator has no adequate remedy at law in an action for damages by reason of the practice of the said infringements by the said defendant; and your orator alleges upon information and belief, that the profits of which your orator has been deprived, and which have accrued

to the said defendant, and the damages which have been suffered by your orator by the wrongful and unlawful infringing acts of the said defendant herein complained of, amount to the sum of Fifteen Thousand Dollars ($15,000.00).

That for the wrongs and injuries herein complained of your orator has no plain, speedy or adequate remedy at law, and forasmuch as your orator is without remedy save in a court of equity where matters of this kind are properly cognizable and relievable;

To the end, therefore, that the said defendant may, if it can, show why your orator should not have the relief herein prayed and may, according to the best and utmost of its knowledge, remembrance, information, and belief, full, true, direct and perfect answer make to all and singular the matters hereinbefore stated and charged, but not under oath, answer under oath being hereby expressly waived.

And your orator further prays, that the said defendant may be decreed to account for and pay over unto your orator all gains and profits thus unlawfully derived from the infringement [33] and violation of your orator's said Letters Patent No. 590,675, and of all of your orator's rights thereunder; and the damages sustained by your orator by reason of such violation and infringement of said rights or letters patent, your orator prays that your Honor may grant a writ of injunction, issuing out of and under the seal of this Honorable Court, perpetually enjoining and restraining the said defendant, its agents, attorneys, servants, employees, workmen and

associates, and each and every of them, from any further use and operation in any manner of your orator's said inventions and improvements covered, described and claimed in the said letters patent aforesaid; and that your Honor, upon rendering the decree above prayed, may assess, or cause to be assessed, in addition to the gains and profits to be accounted for as aforesaid, the damages your orator has sustained by reason of said infringements, and that your Honor may increase the actual damages so assessed to a sum three times the amount of such assessment under the circumstances of the wilful and unjust infringements of said defendant as herein set forth; and your orator further prays that a provisional or preliminary injunction be issued out of and under the seal of this Honorable Court enjoining and restraining the said defendant, its agents, attorneys, servants, employees, workmen and associates, and each and every of them, during the pendency of this suit, from any further infringement of said letters [34] patent No. 590,675, and of all of your orator's rights thereunder, and from continuing the use and operation of said patented inventions and improvements; and your orator further prays that the ore concentrators or ore concentrating tables or apparatus now in the possession of or under the control of the said defendant and infringing the rights and letters patent of your orator as aforesaid, and each and every of them, may be destroyed under the orders of this court; and for such other and further relief as the equity of the case may require and to your Honor may seem meet.

May it please your Honor to grant unto your

orator not only a writ of injunction conformable to the prayer of this Bill of Complaint, but also a writ of subpoena of the United States of America, directed to the said defendant, commanding it on a day certain to appear and answer unto this Bill of Complaint, and abide and perform such order and decree in the premises as the Court may deem proper and be required by the principles of equity and good conscience.

And your orator will ever pray, etc.

Dated this 18th day of February, A. D. 1910.

THE MINE AND SMELTER SUPPLY COMPANY,

By A. H. SEEP,
Vice-President.

[35] FREDERICK S. NAVE,
Solicitor for Complainant.

GEO. L. HODGES,
D. EDGAR WILSON,
Of Counsel for Complainant,
603–7 Ernest & Cranmer Building,
Denver, Colorado.

State of Colorado,
City and County of Denver,—ss.

A. H. Seep, being first duly sworn, on his oath deposes and says: That he is the Vice-president of The Mine and Smelter Supply Company, a corporation, and the complainant named in the above and foregoing Bill of Complaint; that he has read the said Bill of Complaint and knows the contents thereof, and that the matters and things therein stated are true of his own knowledge except as to those matters and

things as are therein stated to be made upon information and belief, and as to such matters and things he verily believes the same to be true.

A. H. SEEP.

Subscribed and sworn to before me, this 18th day of February, [36] A. D. 1910.

My Commission expires February 23, 1911.

HORACE A. KENNEDY,
Notary Public.

[Endorsements]: No. 12 (1). In Equity. United States of America, Territory of Arizona. The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Arizona Copper Company, a Corporation, Defendant. Filed at 10:30 o'clock A. M., February 24, 1910. George H. Smalley, Clerk. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy. Bill of Complaint.

UNITED STATES OF AMERICA.

In the District Court of the Fifth Judicial District, of the Territory of Arizona, Having and Exercising the Same Jurisdiction Under the Constitution and Laws of the United States as is Vested in the District and Circuit Courts of the United States.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY, OF ARIZONA, a Corporation,

Defendant.

Summons [in Case No. 20A].

[37] Action brought in the District Court of the Fifth Judicial District, Territory of Arizona.

The United States of America, Territory of Arizona, Sends Greeting to Detroit Copper Mining Company of Arizona, a Corporation.

You are hereby summoned and required to appear in an action brought against you by the above-named plaintiff in the District Court of the Fifth Judicial District of the Territory of Arizona, and answer the complaint filed with the Clerk of this court at Globe in said District (a copy of which complaint accompanies this summons) within twenty days (exclusive of the day of service) after the service upon you of this summons, if served in this County; but if served out of the County and within this District, then within thirty days; in all other cases forty days.

And you are hereby notified that if you fail to appear and answer the complaint as above required, the plaintiff will apply to the Court for the relief therein demanded and costs and disbursements in this behalf expended.

Given Under My Hand and the Seal of said District Court, at Globe, this 24th day of February, 1910.

[Seal] GEORGE H. SMALLEY,

Clerk.

Office of the United States Marshal,
For the Territory of Arizona,—ss.

[38] I HEREBY CERTIFY that I received the within summons on the 26th day of February, A. D. 1910, and personally served the same on the 8th day of March, A. D. 1910, on Charles E. Mills, he being the Statutory Agent of the within named defendant corporation, being the defendant named in the summons, by delivering it, and leaving with said defendant personally, in the County of Graham, a copy of said summons, together with a true and correct copy of the complaint in this action.

C. A. OVERLOCK,
Marshal.
By D. N. Willits,
Deputy Marshal.

Marshal's Fees and Expenses:

Service 1 person	$4.00
Expenses	35.15
	$39.15

[Endorsements]: No. 11 (3). Marshal's Docket #231. United States of America, District Court, Fifth Judicial District, Territory of Arizona. The Mine & Smelter Supply Company, a Corporation, Plaintiff, vs. Detroit Copper Mining Company, of Arizona, a Corporation, Defendant. Filed March 12th, 1910. George H. [39] Smalley, Clerk. By Elsie Patton, Deputy Clerk. Filed March 13th, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

UNITED STATES OF AMERICA.

In the District Court of the Fifth Judicial District, of the Territory of Arizona, Having and Exercising the Same Jurisdiction Under the Constitution and Laws of the United States as is Vested in the District and Circuit Courts of the United States.

No. 12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Summons [in Case No. 21A].

Action brought in the District Court of the Fifth Judicial District, Territory of Arizona.

The United States of America, Territory of Arizona, Sends Greeting to Arizona Copper Company, a Corporation.

You are hereby summoned and required to appear in an action brought against you by the above-named plaintiff in the District Court of the Fifth Judicial District of the Territory of Arizona, and answer the complaint filed with the Clerk of this court at Globe in said District (a copy of which complaint [40] accompanies this summons) within twenty days (exclusive of the day of service) after the service upon you of this summons, if served in this county; but if served out of the county and within this district, then

within thirty days; in all other cases forty days.

And you are hereby notified that if you fail to appear and answer the complaint as above required, the plaintiff will apply to the Court for the relief therein demanded and costs and disbursements in this behalf expended.

Given under my hand, and the seal of said District Court, at Globe, this 24th day of February, 1910.

[Seal] GEORGE H. SMALLEY,
Clerk.

Office of the United States Marshal,
For the Territory of Arizona,—ss.

I HEREBY CERTIFY that I received the within summons on the 26th day of February, A. D. 1910, and personally served the same on the 7th day of March, A. D. 1910, on Alexander Torrence Thompson, he being the Statutory Agent of the within-named defendant corporation, being the defendant named in the summons, by delivering it, and leaving with said defendant personally, in the county of Graham, a copy of said summons, together with a true and correct copy of the complaint in this action.

[41] C. A. OVERLOCK,
Marshal.
By D. N. Willits,
Deputy Marshal.

Marshal's Fees:

Service 1 person	$ 4.00
Mileage	28.08
	$32.08

[Endorsements]: No. 12. (2). Docket No. 232. No. 21A. United States of America, District Court, Fifth Judicial District, Territory of Arizona. The Mine & Smelter Supply Company, a Corporation, Plaintiff, vs. Arizona Copper Company, a Corporation, Defendant. Filed March 12, 1910. George H. Smalley, Clerk. By Elsie Patton, Deputy Clerk. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Laws and Constitution of the United States as is Vested in the Circuit and District Courts of the United States.

[42] No. 20A.—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Answer [of Detroit Copper Mining Co.].

The said defendant, the DETROIT COPPER MINING COMPANY OF ARIZONA, for answer to the Bill of Complaint of the complainant, answering, says:

I.

The defendant admits that it is a corporation organized and existing under the laws of the State of Michigan and doing business at Morenci, in the County of Graham, in the Territory of Arizona and that the complainant is a corporation organized under the laws of the State of Colorado, and having its principal office and place of business at Denver, in the County of Denver in said State.

II.

And the defendant, answering further, admits that a patent dated September 28, 1897, and numbered 590,675, was granted by the United States Commissioner of Patents to one Arthur R. Wilfley for improvements in ore concentrators, but whether **[43]** the said Arthur R. Wilfley was the original, first and sole inventor of the said improvements the defendant does not know, and it has no knowledge whether the said patent was applied for and issued in due form of law; and it has no knowledge whether the said Arthur R. Wilfley, after the grant of said patent, assigned, transferred and conveyed to the complainant all his interest in and to his invention and improvements in ore concentrators and in and to said Letters Patent; and as to all those matters it leaves the complainant to make proof as it may be advised.

III.

And the defendant, answering further, says that it has no knowledge whether the improvements in ore concentrators set forth, described and claimed

in said patent have gone into great and extended use and have displaced and superseded to a great extent all other apparatus and means for ore dressing by concentration, or whether others have acknowledged and acquiesced in the complainant's claims under patent, or whether twelve thousand or any other number of said patented improvements have been made, or whether large sums of money have been expended by the complainant in the construction and equipment of a plant for the manufacture thereof; and as to all those matters it leaves the complainant to make proof as it may be advised.

IV.

And said defendant, answering further, says that as to [44] the alleged prior suit by said Arthur R. Wilfley against the Denver Engineering Works Company, Ira A. Cammett and Frank E. Shepard, and the proceedings and judgment therein it has no knowledge and leaves the complainant to make proof as it may be advised.

V.

And said defendant, answering further, denies that it has at any time purchased from anyone, owned, or used any ore concentrator, or ore concentrating tables containing and embodying the invention and improvements set forth, described and claimed in said United States Letters Patent 590,675; and denies that it has ever used, or is using any ore concentrators, or ore concentrating tables with riffles upon the tops or concen-

trating surfaces thereof which, in their construction, adjustment and arrangement upon said table surfaces substantially embody and contain the improvements and invention so patented to said Arthur R. Wilfley by said patent 590,675, or infringe the first, second and seventh claims of said patent, or any of them, or any of its claims.

VI.

And said defendant, answering further, says that the art of making and using ore concentrators and ore concentrating tables was an old and well known art, and such concentrators and concentrating tables had been made and patented and used in many forms before the said Arthur R. Wilfley made the inventions [45] or produced the apparatus described in said patent 590,675: and in support of this averment and to show the state of the prior art the defendant will offer in evidence to be read at the final hearing the following United States patents; and if others shall come to its knowledge before the final hearing, it will ask leave to incorporate them into this answer by amendment or notice:

No. 35,197, Baron, May 6, 1862.
No. 70,914, Stiles, Nov. 12, 1867.
No. 149,622, Wilder, Apr. 14, 1874.
No. 159,347, Nevin, Feb. 2, 1875.
No. 258,879, Blatchley & K., June 6, 1882.
No. 349,504, Krause, Sept. 21, 1886.
No. 415,999, Gates, Nov. 26, 1889.
No. 439,962, Look, Nov. 4, 1890.
No. 513,849, Waitt, Jan. 30, 1894.

No. 528,242, Look, Sept. 18, 1894.
No. 528,503, Chatterson, Oct. 30, 1894.
No. 533,362, Lampert, Jan. 19, 1895.
No. 565,812, Stoddard, Aug. 11, 1896.
No. 566,533, Pike, Aug. 25, 1896.
No. 566,534, Pike, Aug. 25, 1896.

VII.

And said defendant, answering further, says that inasmuch as the invention described and claimed in said patent 590,675 was for a narrow and specific improvement in an old art said **[46]** patent is to be construed and limited accordingly, and that it must be taken to apply only to apparatus covered clearly and closely by its specification and claims, and that the defendant has never owned, or used any ore concentrators, or concentrating tables covered by the claims of said patent so construed and applied.

VIII.

And said defendant, answering further, says that it denies all infringement of any exclusive rights secured to the complainant by said patent 590,675, and all profits by it from any such infringement, and all damages to the complainant by reason of any such infringement by it; and it denies all the material allegations of the said bill of complaint not hereinbefore referred to and herein admitted, denied, or answered.

All of which defenses this defendant is ready to prove as the Court shall direct, and it prays to be

discharged hence with its costs in this behalf incurred.

THE DETROIT COPPER MINING COMPANY OF ARIZONA.

Per C. E. MILLS,
Superintendent and Agent.

W. K. FLORA,
E. E. ELLINWOOD,
Attorneys and Solicitors for Defendant.
R. S. TAYLOR,
E. M. HULSE,
Of Counsel for the Defendant.

[47] Received copy of the written answer of defendant in case of The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company of Arizona, a Corporation, Defendant, in Equity, No. 20A, United States Court, Fifth District, Arizona, this 4th day of April, 1910.

FREDERICK S. NAVE,
Attorney and Solicitor for the Complainant.

[Endorsements]: No. 11 (4). No. 20A. In Equity. In the District Court of the Fifth Judicial District of the Territory of Arizona Having and Exercising the Same Jurisdiction in all Cases Arising Under the Laws and Constitution of the United States as is Vested in Circuit and District Courts of the United States. The Mine & Smelter Supply Co., a Corporation, Complainant, vs. Detroit Copper Mining Company of Arizona, a Corporation, Defendant. Filed April 4th, 1910. Geo. H. Smalley, Clerk. Filed March 13, 1912. Allan B.

Jaynes, Clerk. By W. E. Boggs, Deputy. E. E. Ellinwood, W. K. Flora, Attorneys and Solicitors for Defendant. R. S. Taylor, E. M. Hulse, of Counsel.

[48] *In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.*

No. 20A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Answer [of Arizona Copper Co.].

The said defendant, the Arizona Copper Company, for answer to the Bill of Complaint of the complainant, answering says:

I.

The defendant admits that it is a corporation organized and existing under and by virtue of the general incorporation laws of, and doing business in the County of Graham in the Territory of Arizona; and that the complainant is a corporation organized under the laws of the State of Colorado, and having its principal office and place of business at Denver, in the County of Denver in said State.

II.

And the defendant, answering further, admits that a patent dated September 28, 1897, and numbered 590,675, was granted by the United States Commissioner of Patents to one Arthur R. Wilfley for improvements in ore concentrators, but whether the said Arthur **[49]** R. Wilfley was the original, first and sole inventor of the said improvements the defendant does not know, and it has no knowledge whether the said patent was applied for and issued in due form of law; and it has no knowledge whether the said Arthur R. Wilfley, after the grant of said patent, assigned, transferred and conveyed to the complainant all his interest in and to his said invention and improvements in ore concentrators and in and to said Letters Patent; and as to all those matters it leaves the complainant to make proof as it may be advised.

III.

And the defendant, answering further, says that it has no knowledge whether the improvements in ore concentrators set forth, described and claimed in said patent have gone into great and extended use and have displaced and superseded to a great extent all other apparatus and means for ore dressing by concentration, or whether others have acknowledged and acquiesced in the complainant's claims under said patent, or whether twelve thousand or any other number of patented improvements have been made, or whether large sums of money have been expended by the complainant in the construction and equipment of a plant for the

manufacture thereof; and as to all these matters it leaves the complainant to make proof as it may be advised.

IV.

And the defendant, answering further, says that as [50] to the alleged prior suit by said Arthur R. Wilfley against the Denver Engineering Works Company, Ira A. Cammett and Frank E. Shepard, and the proceedings and judgment therein it has no knowledge and leaves the complainant to make proof as it may be advised.

V.

And said defendant, answering further, denies that it has at any time purchased from anyone, owned, or used any ore concentrator, or ore concentrating tables containing and embodying the invention and improvements set forth, described and claimed in said United States letters patent 590,675; and denies that it has ever used, or is using any ore concentrators, or ore concentrating tables with riffles upon the tops or concentrating surfaces thereof, which in their construction, adjustment and arrangement upon said table surfaces substantially embody and contain the improvements and invention so patented to said Arthur R. Wilfley by said patent 590,675, or infringe the first, second and seventh claims of said patent, or any of them, or any of its claims.

VI.

And said defendant, answering further, says that the art of making and using ore concentrators and ore concentrating tables was an old and well-known art, and such concentrators and concentrating table

had been made and patented and used in many forms before the said Arthur R. Wilfley made the inventions or produced the apparatus described in said [51] patent 590,675; and in support of this averment and to show the state of the prior art the defendant will offer in evidence to be read at the final hearing the following United States patents; and if others shall come to its knowledge before the final hearing, it will ask leave to incorporate them into this answer by amendment or notice:

No. 35,197, Baron, May 6, 1862.
No. 70, 914, Stiles, Nov. 12, 1867.
No. 149,622, Wilder, April 14, 1874.
No. 159,347, Nevin, Feb. 2, 1875.
No. 258,879, Blatchley & K., June 6, 1882.
No. 349,504 Krause, Sept. 21, 1886.
No. 415,999, Gates, Nov. 26, 1889.
No. 439,962, Look, Nov. 14, 1890.
No. 513,849, Waitt, Jan. 30, 1894.
No. 526,242, Look, Sept. 18, 1894.
No. 528,503, Chatterson, Oct. 30, 1894.
No. 533,362, Lampert, Jan. 19, 1895.
No. 565,812, Stoddard, Aug. 11, 1896.
No. 566,533, Pike, Aug. 25, 1896.
No. 566,534, Pike, Aug. 25, 1896.

VII.

Said defendant, answering further, says that inasmuch as the invention described and claimed in said patent 590,675 [52] was for a narrow and specific improvement in an old art, said patent is to be construed and limited accordingly, and that it must be taken to apply only to apparatus covered

clearly and closely by its specification and claims, and that the defendant has never owned or used any ore concentrators or concentrating tables covered by the claims of said patent so construed and applied.

VIII.

And said defendant, answering further, says that it denies all infringement of any exclusive rights secured to the complainant by said patent 590,675 and all profits by it from any such infringement, and all damages to the complainant by reason of any such infringement by it; and it denies all the material allegations of the said bill of complaint not hereinbefore referred to and herein admitted, denied or answered.

All of which defenses this defendant is ready to prove as the Court shall direct, and it prays to be discharged hence with its costs in this behalf incurred.

ARIZONA COPPER COMPANY,
By NORMAN CARMICHAEL,
Vice-President.
M. J. EGAN,
Counsel for Defendant.
[Corporate Seal] N. G. THOMPSON,
Secretary.

[53] R. S. TAYLOR,
E. M. HULSE,
Of Counsel for the Defendant.

[Endorsements]: No. 12 (4). District Court of the Fifth Judicial District of Arizona. The Mine and Smelter Supply Company vs. Arizona Copper Company. Answer. Filed Apr. 4, 1910. Geo. H. Smalley Clerk. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

No. 20A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Amendment to Answer [of Detroit Copper Min. Co.].

The defendant by leave of Court amends its answer as follows:

On page 3 at the end of paragraph V insert the following words, "Saving and excepting, however, from the averments of [54] this paragraph the fact that it has used and is still using a number of ore concentrating tables manufactured by the complainant in this cause and embodying in their construction and operation the invention described and claimed in said patent 590,675, which fact was unknown to counsel for the defendant who drew the answer until after the same had been executed and filed."

On page 3 at the end of paragraph VI, following

the list of United States patents there referred to add the following further United States patents:

290,008, Doyle & Burr, Dec. 11, 1883.
291,872, Brown, Jan. 15, 1884.
336,607, Brown, Feb. 1886.
385,551, Gould, July 3, 1888.
473,644, Schulenburg, Apr. 26, 1892.
519,987, Card, May 15, 1894.

ROBERT S. TAYLOR,
Counsel for Defendant.

We consent that the foregoing amendment may be filed and stand as a part of the answer.

GEO. L. HODGES,
D. EDGAR WILSON,
Counsel for Complainant.

[Endorsements]: No. 11 (5). In Equity. District Court of Arizona. [55] The Mine and Smelter Supply Company vs. Detroit Copper Mining Company of Arizona. Amendment to Answer. Filed May 23, 1910. George H. Smalley, Clerk. By Elsie Patton, Deputy. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

No. 21A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Amendment to Answer [of Arizona Copper Co.].

The defendant by leave of Court amends its answer as follows:

On page 3 at the end of paragraph V insert the following words, "Saving and excepting, however, from the averments of this paragraph the fact that it has used and is still using a number of ore concentrating tables manufactured by the complainant in this cause and embodying in their construction and operation the invention described and claimed in said patent 590,675 [56] which fact was unknown to counsel for the defendant who drew the answer until after the same had been executed and filed."

On page 3 at the end of paragraph VI, following the list of United States patents there referred to, add the following further United States patents:
290,008, Doyle & Burr, Dec. 11, 1883.

291,872, Brown, Jan. 15, 1984.
336,507, Brown, Feb. 16, 1886.
385,551, Gould July 3, 1888.
473,644, Schulenburg, Apr. 26, 1892.
519,987, Card, May 15, 1894.

ROBERT S. TAYLOR,
Counsel for Defendant.

We consent that the foregoing amendment may be filed and stand as part of the answer.

GEORGE L. HODGES,
D. EDGAR WILSON,
Counsel for the Complainant.

[57] [Endorsements]: No. 12 (5) District Court of Arizona. The Mine and Smelter Supply Company vs. Arizona Copper Company. Amendment to Answer. Filed May 23, 1910. George H. Smalley, Clerk. By Elsie Patton, Deputy. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

[Replication to Answer as Amended of Detroit Copper Min. Co.]

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

No. 20A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

REPLICATION OF THE MINE AND SMELTER COMPANY, COMPLAINANT, TO THE ANSWER AS AMENDED OF THE DETROIT COPPER MINING COMPANY OF ARIZONA, DEFENDANT.

[58] This repliant, saving and reserving unto itself, now and at all times hereafter, all and all manner of benefit and advantage of exception which may be had and taken to the manifold errors, uncertainties and insufficiencies of the said answer as amended of the said defendant, for replication thereunto, saith:

That it doth and will aver, maintain and prove its said bill of complaint herein to be true, certain and

sufficient in the law to be amended unto by the said defendant, and that the said answer as amended of the said defendant is very uncertain, untrue, evasive and insufficient in law to be replied unto by this repliant; without this, that any other matter or thing in the said answer as amended contained, material or effectual in the law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed, or denied, is true; all which matters and things this repliant is ready to aver, maintain and prove as this Honorable Court shall direct, and humbly prays as in and by its said bill of complaint herein it hath already prayed.

Dated this 12th day of July A. D. 1910.

THE MINE AND SMELTER SUPPLY COMPANY,

By FREDERICK S. NAVE,

Solicitor for Complainant.

[59] GEORGE L. HODGES,

D. EDGAR WILSON,

Of Counsel for Complainant.

[Endorsements]: No. 11 (6). In Equity. In the District Court of the Fifth Judicial District of the Territory of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Detroit Copper Mining Company of Arizona, Defendant. Replication. Filed July 12, 1910. George H. Smalley, Clerk. By E. B. Van Veen, Deputy. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

[Replication to Answer as Amended of Arizona Copper Co.]

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

No. 21A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

REPLICATION OF THE MINE AND SMELTER SUPPLY COMPANY, COMPLAINANT, TO THE ANSWER AS AMENDED OF THE ARIZONA COPPER COMPANY, DEFENDANT.

[60] This repliant, saving and reserving unto itself, now and at all times hereafter, all and all manner of benefit and advantage of exception which may be had and taken to the manifold errors, uncertainties and insufficiencies of the said answer as amended of the said defendant, for replication thereunto, saith:

That it doth and will aver, maintain and prove its said bill of complaint herein to be true, certain and sufficient in the law to be answered unto by the said

defendant, and that the said answer as amended of the said defendant is very uncertain, untrue, evasive and insufficient in law to be replied unto by this repliant; without this, that any other matter or thing in the said answer as amended contained, material or effectual in the law to be replied unto, and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things this repliant is ready to aver, maintain and prove as this Honorable Court shall direct, and humbly prays as in and by its said bill of complaint herein it hath already prayed.

Dated this 12th day of July, A. D. 1910.

THE MINE AND SMELTER SUPPLY COMPANY,

By FREDERICK S. NAVE,

Solicitor for Complainant.

GEO. L. HODGES,

D. EDGAR WILSON,

Of Counsel for Complainant.

[Endorsements]: No. 12 (3). In Equity. In the District Court of the [61] Fifth Judicial District of the Territory of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Arizona Copper Company, Defendant. Replication. Filed July 12, 1910. George H. Smalley, Clerk. By E. B. Van Veen, Deputy. Filed March 13, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.

No. 20A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Stipulation [That Depositions, etc., in Case No. 21A may be Introduced in Case No. 20A, and Admission as to Operation of Mill, etc.].

IT IS HEREBY STIPULATED AND AGREED by and between the parties to the above-entitled cause, by the undersigned, their respective solicitors and of their respective counsel therein, that the depositions, exhibits and stipulations of fact, taken, introduced and entered into in the cause No. 21A, in Equity, pending in this court, wherein the complainant herein, The Mine and Smelter Supply Company is complainant, and Arizona Copper Company is defendant, or true copies and duplicates thereof, and copies of printed abstracts and briefs in said cause, may be introduced, [62] exhibited and considered at the hearing of this cause, the same to

all intents and purposes, and with like effect, as if the same had been regularly taken, introduced and entered into and entitled in this cause; and the defendant herein, by its solicitors and counsel, admit that the mill located at Morenci, Arizona, wherein the complainant's witness, Henry Eggers, testified in said Equity Cause, No. 21A, to having observed in operation Deister ore-concentrating tables, represented by the Complainant's Exhibits Numbered 5, blue-print, and 6, model, introduced in evidence in said cause No. 21A, was, on and prior to January 1st, 1910, and ever since said date has been operated during all of said time the Deister tables referred to in the said testimony of the said witness Eggers, have been in actual use by the said defendant in said mill.

Dated Denver, Colorado, Dec. 13, A. D. 1910.

FREDERICK S. NAVE,
Solicitor for Complainant.
TAYLOR & HULSE,
Solicitors for Defendant.

GEO. L. HODGES,
D. EDGAR WILSON,
Of Counsel for Complainant.

[Endorsements]: No. 11 (7). In Equity. In the District Court of the Fifth Judicial District of the Territory of Arizona. The Mine & Smelter Supply Co., a Corporation, Complainant, vs. Detroit Copper Mining Company of Arizona, a Corporation, Defendant. Stipulation. Filed August 8, 1911. Geo. H. Smalley, Clerk. Filed March 23, 1912. Allan B. Jaynes, Clerk. By W. E. Boggs, Deputy.

[63] Before the proceeding to the taking of depositions of witnesses on behalf of complainant, to maintain the issues in its behalf, the following stipulation was made and entered into in said cause, on September 12, 1910, dated on said day and filed with Almon E. Hart, stenographer and reporter, and a notary public, within and for the City and County of Denver, State of Colorado, who is designated as a Special Examiner in said cause, under the Sixty-seventh rule in Equity, as amended, to be filed in said court in said cause by said Examiner, together with the depositions in behalf of said complainant as Special Examiner.

Stipulation [as to Taking of Depositions, etc.].

IT IS HEREBY STIPULATED AND AGREED by and between the parties to the above-entitled cause, by the undersigned, their respective solicitors and of their respective counsel therein, as follows, to wit:

That the depositions of witnesses on behalf of both complainant and defendant may be taken before Almon E. Hart, stenographer and reporter, and a notary public within and for the City and County of Denver and State of Colorado, and that the said Almon E. Hart is hereby selected and agreed upon to serve and to act as a special examiner [64] in said cause under the sixty-seventh rule in equity, as amended, to take the said testimony within the District and State of Colorado, and to report the same to the said Court, the same and as fully to all in-

tents and purposes as if duly appointed and assigned by order of said Court.

That in case the said Almon E. Hart shall, for any reason, be unable to act, or to proceed with, or to complete the taking of testimony on behalf of either the said complainant or defendant, or in case it shall be desired by counsel for either complainant or defendant respectively, to take testimony in places within the State of Colorado other than in said City and County of Denver, or in places without the said State, and within the United States or its Territories, the depositions of witnesses may be taken before any notary public or other officer authorized by the law of the place where such depositions shall be taken to administer oaths, who may be named and designated by counsel for the party on whose behalf the said depositions are sought to be taken, by notice unless appearance shall be made and notice waived and that the person and the respective persons who shall be so named and designated, or before whom counsel for both parties shall voluntarily appear without notice, [65] is and are hereby selected and agreed upon to serve and to act as special examiner or examiners in said cause, under the sixty-seventh rule in equity, as amended, to take the said testimony on behalf of the party or parties to said cause so designating such person or persons, the same and as fully to all intents and purposes as if duly appointed, assigned and commissioned by order of said Court.

Dated Denver, Colorado, September 12th, A. D. 1910.

FREDERICK S. NAVE,
Solicitor for Complainant.

GEO. L. HODGES,
D. EDGAR WILSON,
Of Counsel for the Complainant.

W. K. FLORA,
E. E. ELLENWOOD,
Solicitors for Defendant.

ROBERT S. TAYLOR,
ELWIN M. HULSE,
Of Counsel for Defendant.

[Proceedings Had Before Special Examiner at Denver, Colorado, in Case No. 21A.]

[66] *In the District Court of the Fifth Judicial District of the Territory of Arizona, Having and Exercising the Same Jurisdiction in All Cases Arising Under the Constitution and Laws of the United States as Vested in the Circuit and District Courts of the United States.*

No. 21A—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,
Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,
Defendant.

BE IT REMEMBERED, that on, to wit, Monday the 12th day of September, in the year of our Lord one thousand nine hundred and ten, in pursuance of the stipulation hereto attached, the parties to the above-entitled cause appeared before me, Almon E. Hart, a notary public within and for the City and County of Denver, Colorado, and Special Examiner in said cause as designated in said stipulation under the 67th Rule in Equity, as amended at the offices of Messrs. Hodges and Wilson, Rooms [67] Nos. 603–607, Ernest and Cranmer Building, in said City of Denver, Colorado; the said complainant appearing by George L. Hodges, Esq., and D. Edgar Wilson, Esq., of Denver, Colorado, and the respondent appearing by E. M. Hulse, Esq., of the firm of Taylor and Hulse, of Fort Wayne, Indiana.

WHEREUPON THE FOLLOWING PROCEEDINGS WERE HAD, to wit:

[Stipulation as to Evidence, Exhibits and Ownership of Letters Patent No. 590,675.]

It was thereupon stipulated by and between the solicitors and counsel for the respective parties that uncertified printed copies of letters patent as furnished by the patent office of the United States and foreign countries might be exhibited and introduced as evidence and used with the same force and effect, both on behalf of complainant and defendant, as duly and regularly certified copies of such letters patent would have.

It was further stipulated that counsel introducing exhibits, models, etc., should have the right to retain

the possession of the same until they are needed for use upon the hearing, subject to the right of either party to examine them at either time.

It was further stipulated and agreed that since about October 12, 1905, the complainant has been and still is the sole and exclusive owner of the patented improvements and inventions covered by United States letters patent numbered 590,675, dated September 28, 1897, issued to Arthur R. Wilfley.

[68] *In the District Court of the United States for the District of Arizona.*

#11 and #12.

THE MINE AND SMELTER SUPPLY COMPANY,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY,

Plaintiff,

vs.

ARIZONA COPPER COMPANY,

Defendant.

Decision by the Court.

The issue made by the pleadings in the above-entitled causes is whether the machine known as the

Deister Concentrator and used by the defendants in their respective mills at Morenci, Arizona, is an infringement of the patent owned by the plaintiff for the machine known as the Wilfley Concentrator, which patent was issued and bears date September 28, 1897. It is not contended that the Deister machine is an infringement of the patent issued for the Wilfley machine except in the construction, adjustment and arrangement upon the table surface of the Deister of riffles of such kind and character and in such a [69] way as to embody the principle and perform the function or functions embodied and performed in the construction, adjustment and arrangement of riffles upon the table surface of the Wilfley machine. It is contended in behalf of the plaintiff that the Wilfley patent embodied a new principle in the art of wet concentration of ore and the machine patented was the first to perform a new and definite function in the practice of ore dressing, so as to produce both increased efficiency and capacity. On the other hand, it is contended in behalf of the defendants that the Wilfley patent was for a narrow and specific improvement in an old art, and therefore to be construed and limited accordingly, and as so construed does not cover any essential feature embodied in the Deister machine.

The evidence bearing upon the issue is voluminous and, in some instances, in sharp conflict. In stating the conclusions I have reached from the consideration of this evidence in the light of the argument and briefs of counsel, I shall not attempt to analyze this evidence, but shall confine myself to a statement of

the conclusions I have reached from my study of the record.

The Wilfley machine may be generally described as a transversely inclined concentrating table, having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot, the riffle at the top being the shortest [70] and the next lower riffle extending a short distance beyond the one above, all forming a series of riffles of unequal length with advancing terminals, each riffle terminating on a smooth part of the table of suitable area, the table being provided with means for feeding the pulp to the upper portion of the table's head and for discharging water along the upper edge of the table so as to subject the material to be concentrated to the washing effect of the water, and, as it is carried across the riffled surface, to the action of gravity as effected by a longitudinally reciprocating movement of a character adapted to move the heavier material containing the mineral in the course of the riffles towards the smooth portion of the table, and the lighter portion carried over the riffles towards that portion of the tail of the table arranged to receive such lighter portions.

The Deister machine differs in shape and size from the Wilfley, but contains the common features as to the method by which the material is carried over the table, and as to the method of utilizing the same combination of agencies or forces, on the washing effect of water flowing by gravity, and the other the vibrating motion automatically controlled by mechanical means. Both tables contain riffles, but on the

Deister table certain of the riffles are proportionately higher than the others, and these higher riffles are placed at regular [71] intervals on the table. On the Wilfley table, all the riffles are of the same height.

The two tables differ in this, that on the Wilfley table the riffles terminate on a relatively smooth portion of the surface of the table, while on the Deister table the riffles have slightly deflected ends, each alternate end being longer than the one above and terminating at an opening into which the separated minerals or concentrates are discharged, and the others terminating on a smooth surface a few inches from the edge of the table. These deflected ends are much lower than the riffle itself, being one thirty-second of an inch in height.

The Wilfley patent is admitted by the defendants to be valid, and therefore the controversy regarding it relates to its scope and the particular device or devices, or combination of devices embraced therein and covered by its terms. Under the familiar rule applied in the construction of patents, in determining the scope of the Wilfley patent we must be guided by the state of the art of concentration of ores prior to and at the date of its issuance. With regard to the particular device or devices protected by the patent, we must look, first, to the machine patented to determine what, if any, feature embodies a new principle or discharges a new [72] function and was, therefore, at the date of the patent, patentable in itself, and, second, to the claim made by the patentee and to the language of the patent as affected by such restrictions or limitations as may appear therein. If,

as contended by the counsel for the defendants, the Wilfley patent was not for an original invention in the sense that it embodied an entirely new principle in the art of wet concentration but the Wilfley was a mere improvement upon tables which at the date of the patent therefor had already been devised by others and known to the art, then, under the well settled rule of construction referred to above, the Deister machine is not to be held to be an infringement on the Wilfley table if it applies the same principle by the use of means and devices which are distinguishable in a mechanical sense from those described in the Wilfley patent.

There can be no doubt but that at the date of the Wilfley patent the general principle of wet concentration of ore by means of automatically vibrated tables having riffles extending transversely across the table, was known, and tables embodying these features had been devised and patents issued therefor. None of these patents, however, appear to have been commercially successful and the Wilfley table is unquestionably the first to apply the general principle in such a way as to make its use so desirable as to supplant or rival other wet [73] concentrating devices operated upon the same or other mechanical principle. It did, undoubtedly, mark a distinct step in the development of the art of concentration by the use of machines combining and employing the two co-ordinating agencies or forces—the flow of water by gravity over a table from its head to its foot, and the lateral vibration imparted to the table by mechanical power automatically applied. The improve-

ment differentiating the Wilfley patent from all others preceding it consisted in the use of riffles having advancing terminals and placed on the table at right angles to the course of the wash-water and ending on a plain or smooth surface. The particular functions of these advancing terminals are in subjecting the partially separated concentrates to repeated washings in their course across the table, and also in automatically maintaining a visual line of separation between the mineral and sands, after separation has been effected, until the former may be discharged from the table. In so far as riffles having advancing terminals is an essential feature on any such table in securing both or either of these results, namely, the resubjecting of concentrates to repeated washings in their course across the table and the maintenance, automatically secured, of the visual line of demarcation between the mineral and sands under varying [74] conditions of feed, such a feature must be considered as covered by the Wilfley patent, and the latter must be regarded as such a distinct improvement in the art of concentration as to be entitled to protection against others securing the same results by equivalent means or devices, unless, perchance, the patentee, Wilfley, in his claim has narrowed the patent to the use of such riffles in combination with a smooth surface.

As I have stated, the Deister table differs in appearance and mechanical arrangement from the Wilfley table in the particular that the riffles terminate with slightly deflected ends having an elevation of but one thirty-second of an inch, each alternate

end being so situated that the concentrates are discharged into openings as the final separation is completed, and each of the others terminating on a smooth surface near the edge of the table. The point of deflection in each riffle is slightly in advance of the one above, so that if the deflected ends were removed, the effect would be to have a table with riffles having advancing terminals as in the Wilfley table.

Two theories are presented by the plaintiff with regard to the use and function of the deflected ends in relation to the other parts of the Deister table. Certain of the expert witnesses who have testified in the case in behalf of [75] the plaintiff, and particularly the witness Hodges, advanced the view that the deflected ends with their low elevation perform essentially the same function as the smooth part of the Wilfley table, and that therefore the Deister table in this immediate respect is undistinguishable in principle and in the means of applying the principle from the Wilfley table. Another view is advanced that the spaces between the ends of the short terminals and the edge of the table are the mechanical equivalent of the smooth or unriffled portion of the Wilfley table, and perform the same function, and hence that the two tables are undistinguishable in principle.

It must be admitted that there are facts tending to support both of these views. It seems, however, to me more probable that neither view is wholly right or wholly wrong; that neither the low deflected ends, nor the spaces between the short ends and the edge of the table, can be said to be the exact equivalent of

the smooth or unriffled area on the Wilfley table, but that both devices combined do take the place and perform the essential function or functions discharged by the smooth or unriffled surface of the Wilfley table.

However, as to that, there is another view of the case which I regard as more reasonable and better supported by the evidence. Whether the points of deflection of the riffles [76] on the Deister table be considered as the real terminals, or the points of termination of the deflected ends be so considered, in either case, as is apparent to the eye, the terminals assume, in general, a diagonal course with regard to the plane of the table, that is, with regard to the general direction of the riffles on the table, in this respect resembling in general the arrangement of the riffles on the Wilfley table; that this diagonal course is an essential feature to the successful working of both tables and discharges the same function on both seems to me to be established by the evidence in the case. There can be no doubt from the evidence adduced that until Wilfley used riffles with advancing terminals, no riffled table had been successfully operated. It appears also that in practically every patent which has been issued since for concentrating tables with riffled surfaces, the arrangement of these riffles has been in general that appearing for the first time in the Wilfley patent; that is to say, the ends from which the concentrates are released from their detention assume a diagonal course across the table. I consider this evidence that the form and arrangement of riffles first applied by Wilfley in his patent and

subsequently in the Deister machine, is important, and perhaps essentially important, to the successful operation of tables of the type to which these belong. I am impressed with [77] the fact that the deflected ends of the riffles on the Deister table do not essentially affect the function discharged by this diagonal arrangement of riffles, and very much doubt if any table of the general type of the Deister and operated upon the same general principle could be successfully operated unless the riffles were arranged upon this plan.

I am, therefore, persuaded that this diagonal arrangement of riffles is as essential a feature in the Deister table as in the Wilfley in the performance of its functions.

It is claimed by the defendants that, conceding that the use of riffles with advancing terminals did constitute a distinct step in the art of concentration, yet the patentee, Wilfley, has limited his invention in this regard to its use in combination with "a smooth or unriffled surface" by associating the two in each instance in which he described his invention and attempted to set forth its function or functions in his application for his patent. The letters patent set forth the claims made by Wilfley in his application, pointing out the "part, improvement or combination" which he claimed as his invention or discovery, as follows:

> "1. A transversely-inclined concentrating-table having a movement whose tendency is to carry the material longitudinally forward toward the tail or foot of the table, said table being

provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, said riffles varying in length for the purpose specified, the table [78] having a smooth, plain, or unriffled portion extending from the extremities of the riffles toward the tail of the table, whereby the material as it leaves the riffles is subjected to the action of the water on the smooth portion of the table and the final separation of the mineral from the gangue effected."

"2. A transversely-inclined concentrating-table having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot, said riffles being of unequal length, the uppermost being the shortest while the other riffles increase in length from the upper edge to the lower edge of the table, the table having a plain or unriffled portion lying at the extremities of the riffles and adapted to receive the material caught by the riffles."

"7. The combination of a transversely-inclined concentrating-table having a series of riffles extending longitudinally from the head toward the tail of the table, said riffles being of unequal length, the uppermost being the shortest and the riffles increasing in length from the upper to the lower edge of the table, the table being provided with a plain or unriffled portion of suitable area located at the extremities of the riffles, means for feeding the material to the upper portion of the table's head, means for dis-

charging water on the upper edge of the table, and suitable means for imparting to the table a longitudinally-reciprocating movement of a character adapted to move the material from the head toward the tail of the table."

While the language differs in each one of the specifications quoted, it is quite apparent from a reading of these claims that in the view of the inventor the smooth, plain, or unriffled area of the table constituted an important adjunct to the form and arrangement of riffles described, and discharged a function essential to the successful operation of his device. This is shown by the fact that in each and every [79] instance in which he set forth and described his table, the form and arrangement of riffles is described as being in association with a smooth or unriffled surface. But, assuming that the association of the riffled surface of the table with the smooth or unriffled surface was deemed important or even essential in the view of the inventor, yet if the essential feature of his device, which was new in principle and which in itself constituted a distinct improvement in the art of concentration, may be used in other combinations or with other devices but yet so as to discharge the same or an equivalent function, does the want of foresight in Wilfley in specifying its use in conjunction with such "smooth or unriffled surface" limit the protection afforded by his patent to cases where his arrangement of riffles are similarly combined; that is, with a smooth or unriffled surface, or its mechanical equivalent? To answer this inquiry affirmatively would be to construe the patent as

though it was "for a narrow and specific improvement in an old art," and nothing more than an improvement.

Whether we regard the Wilfley device as a distinct step in the art of wet concentration of ores, it certainly introduced a new principle which was more than a mere improvement on something theretofore known in the art. If an improvement, it was therefore of the kind which, under well-settled [80] rules of construction, is not to be limited strictly to the precise device or arrangement described in his application, but is to be given such a construction as will at least protect the inventor in the use of that feature of his device which is new in principle and which is the essence of his invention, as against others who may use it, or its mechanical equivalent, to produce the same result.

If, therefore, the deflected ends of the riffles on the Deister table, terminating as they do, take the place and perform the same function as the smooth or unriffled portion of the surface of the Wilfley table, or if they perform a new or additional function, yet, if the general arrangement of the riffles on the Deister table is the mechanical equivalent of the advancing terminal arrangement of the riffles on the Wilfley table and this arrangement, as I find to be the case, discharged an essential function in the successful operation of the Deister table as in the Wilfley, then it seems to me that the Wilfley patent, in view of its history and its importance, should be construed, notwithstanding the language used by the inventor in his application, as covering the appropriation by the

Deister table of this essential feature of the Wilfley table and that, therefore, the former is an infringement pro tanto of the Wilfley patent.

[81] In the particular that the arrangement of riffles used on the Desiter table is the equivalent of the advancing terminals on the Wilfley, I hold, therefore, that the Deister table is an infringement upon the Wilfley patent, and that the plaintiff in each of the above-entitled causes is therefore entitled to a judgment and decree of the Court accordingly, and it is so ordered.

RICHARD E. SLOAN,
Judge.

[Endorsements]: No. 11 & No. 12 (11). In the District Court of the United States for the District of Arizona. The Mine and Smelter Supply Company, Plaintiff, vs. Detroit Copper Mining Company of Arizona, Defendant, and The Mine and Smelter Supply Company, Plaintiff, vs. Arizona Copper Company, Defendant. Decision by the Court. Filed January 14, 1913. Allan B. Jaynes, Clerk.

In the District Court of the United States Within and for the District of Arizona.

[82] Nos. 11 and 12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY,

Defendant.

Petition for Rehearing.

The defendants in said causes respectfully ask the Court to grant a rehearing in the same and in support of this petition submit the following reasons therefor and argument thereon.

(1) The Court erred in the view which it took of the construction and operation of the Deister concentrating table.

(2) The Court erred in the construction which it placed upon the claims in suit for the plaintiff's patent.

(3) The Court erred in sustaining the plaintiff's

contention that the Wilfley patent embodied a new principle in the art of wet concentration of ore and was the first to perform a new and definite function in the practice of ore dressing.

(4) The Court erred in ignoring and giving no effect to patent to Blatchly and Kustel No. 258,879, for ore concentrator dated June 6, 1882, which was in evidence on the part of the defendants.

(5) The Court erred in ignoring and giving no effect to patent to Jacob Lampert, No. 533,362, for concentrator, dated January 29, 1895, which was in evidence on the part of the defendants; whereas the Court should have found that said patent to Lampert constitutes a full defense to the defendants against this suit.

(6) The Court erred in holding that the concentrating table in suit, being the table known as Deister concentrator No. 2, was and is an infringement of claims 1, 2, and 7 of the patent in suit.

(7) The defendants have discovered new evidence material to the issue since the making up and closing of the record in said cause in this, to wit, patent to Jacob Cherney and William C. Davis, for ore concentrator. No. 311,863, dated February 3, 1885, a copy of which is filed herewith.

Wherefore the said defendants pray for a rehearing of said cause, and that upon such rehearing a reargument may be allowed and such further orders may be made therein as justice and the law require.

ROBERT S. TAYLOR,
ELWIN M. HULSE,
Solicitors and of Counsel for the Defendants.

[83] *In the District Court of the United States for the District of Arizona.*

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Decree [in Case No. 11].

THIS CAUSE coming on to be finally heard at the October, A. D. 1912, Term of the said court, upon the pleadings and proofs taken by and on behalf of the respective parties hereto, and being argued by counsel for the respective parties; and the pleadings and proofs, and briefs and arguments of counsel having been taken under advisement, and the Court having duly considered the same and being now fully advised in the premises, it is, on this 14th day of January, A. D. 1913, hereby ORDERED, ADJUDGED, and DECREED as follows, to wit:

FIRST: That the letters patent referred to in the complainant's bill of complaint herein, being letters patent of the United States of America, Numbered 590,675, issued and dated September 28th, A. D. 1897, and granted to Arthur R. Wilfley, for "certain new and useful improvements in ore concentrators," are, in all respects as regards and to the extent of the subject-matter of claims numbered one (1), two (2) and

seven (7) thereof (said first (1st), second (2d) and seventh (7th) claims being the only ones as to which proof of infringement has been offered, and, therefore, the only one considered by the Court) good and valid in law.

SECOND: That the said Arthur R. Wilfley was the true original and first inventor of the improvements described in said [84] United States letters patent No. 590,675, and claimed in said first (1st), second (2d) and seventh (7th) claims thereof.

THIRD: That the Mine and Smelter Supply Company, the complainant in said bill of complaint herein, became, on or about the 12th day of October, A. D. 1905, the sole owner of said United States letters patent No. 590,675, by a good and sufficient assignment in writing from the said Arthur R. Wilfley, duly recorded in the Patent Office of the United States; and that the sole and exclusive title to said letters patent, and all rights thereunder, are vested in the complainant as alleged in the said bill of complaint.

FOURTH: That the said defendant, Detroit Copper Mining Company of Arizona, by the use of certain ore concentrators, or ore concentrating tables, machines or apparatus containing and embodying the invention and improvements set forth, described and claimed in said United States letters patent No. 590,675, aforesaid, as alleged, set forth and shown in the bill of complaint and the proofs adduced herein, and as illustrated and shown by the certain drawings and photographs of the same introduced in evidence as exhibits, as well as by the "Full Size Deister Table

Deck No. 1452" introduced in evidence by the complainant, has infringed, and such ore concentrators, or ore-concentrating tables, machines or apparatus do infringe said [85] United States letters patent No. 590,675 to Arthur R. Wilfley, dated September 28th, A. D. 1897, as to claims numbered one (1), two (2) and seven (7) of the said recited United States letters patent No. 590,675, and thereby the said defendant, Detroit Copper Mining Company of Arizona, has infringed and violated the exclusive rights of the complainant therein and thereunder, to the extent of and in respect to the said first (1st), second (2d) and seventh (7th) claims, and each thereof, of the said letters patent No. 590,675.

FIFTH: AND IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the said defendant, Detroit Copper Mining Company of Arizona, its officers, directors, agents, attorneys, servants, employees, workmen and associates, and every and all persons claiming or holding under or through it, and each and every of them, be, and it and they are hereby perpetually enjoined and restrained from either directly or indirectly making, constructing, using or vending to others to be used, the said ore concentrators, or ore-concentrating tables, machines or apparatus complained of in the said bill of complaint herein, or any ore concentrators, or ore-concentrating tables, machines or apparatus constructed and operated in the manner, or substantially the manner and upon the principles described and illustrated in said letters patent of the United States of America No. 590,675 [86] dated September 28th, A. D. 1897,

and claimed in the first (1st), second (2d) and seventh (7th) claims thereof, or either of them; and specifically from making, using or vending to others to be used, any transversely inclined concentrating table or surface, having a movement imparted thereto the tendency of which is to advance the material being treated upon its surface longitudinally forward from the head or mechanism and toward the foot or concentrate discharge end of such table or surface, said table or surface being provided with a number or plurality of riffles extending longitudinally a portion of the distance from its head end toward its foot end, said riffles varying in length so that the tips or terminals thereof advance one beyond the other continuously and substantially along a line diagonal to the direction of the movement imparted to such table or surface from the upper or feed side to the lower or tailing discharge side thereof, such table or surface having a sufficiently smooth, plain or unriffled surface or area, for the purpose set forth, described and illustrated in the specification, drawings and claims of the said United States letters patent No. 590,675, to Arthur R. Wilfley, located at the extremities of the riffles and adapted to receive the material caught by them as it leaves the riffles, and to subject said material to the side-wash of the wash-water and repeated washings described in the specification of said patent, as the same passes along the said diagonally [87] advancing terminals of such riffles; and from doing any act or thing in infringement of the said first (1st), second (2d) and seventh (7th) claims of the said United States letters patent No. 509,675, or

in violation of the exclusive rights so as aforesaid vested in said complainant therein and thereunder; and it is hereby ORDERED that the writ of permanent and perpetual injunction be issued out of and under the seal of this Court accordingly.

SIXTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the complainant recover of the said defendant, Detroit Copper Mining Company of Arizona, the profits, gains and advantages which the said defendant has received or made, or which have arisen or accrued to it from such infringement, and in violation of complainant's rights, by the use of the improvements in ore concentrators, or ore-concentrating tables, machines or apparatus described in and secured by said United States letters patent No. 590,675, and claimed in claims numbered one (1), two (2) and seven (7) thereof, since the 12th day of January, A. D. 1910; and also that the complainant recover the damages which it has sustained by reason of said infringement from and after said date.

SEVENTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED that this cause be referred to Ben. M. Crawford, a Master of this court, to ascertain and take, and report to the Court [88] on account of the gains, profits and advantages which the said defendant, Detroit Copper Mining Company of Arizona, has received, or which have arisen or accrued to it since the 12th day of January, A. D. 1910, from infringing the said exclusive rights of the said complainant by the use of the said improvements in ore concentrators, or ore-concentrating tables, de-

scribed and secured by claims numbered one (1), two (2), and seven (7) of the said letters patent No. 590,-675, and to ascertain and report the damages which the said complainant has sustained by said infringement, from the papers and evidence in this cause, and from any evidence which either party may produce before him of the same; and when he shall have had an account of said gains, profits and advantages, and assessed the damages therefor, he shall return the same to this court for further action in the premises.

EIGHTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED, that the complainant on such accounting have the right to cause an examination of the officers, directors and employees of the said defendant corporation, *ore tenus,* or otherwise, and also the production of the books, vouchers and documents of said defendant corporation, and that the officers, directors and employees of said defendant corporation attend before the said Master from time to time as said Master shall direct.

[89] NINTH: IT IS FURTHER ORDERED that the question of increase of damages and all other matters not herein provided, be reserved until the coming in of the Master's report.

TENTH: IT IS FURTHER ORDERED that the parties and the Master may apply upon due notice to the Court, for such further order or instruction as may be necessary, at the foot of this decree.

ELEVENTH: AND IT IS FURTHER ORDERED, ADJUDGED AND DECREED, that the complainant recover of said defendant, Detroit Copper Mining Company of Arizona, its costs, charges

and disbursements in this suit, to be taxed.

Done in open court at Phoenix, Arizona, this 14th day of January, A. D. 1913.

By the Court:

RICHARD E. SLOAN,
District Judge.

The foregoing form of decree is assented to by the defendant.

TAYLOR and HULSE,
Solicitors of Counsel for the Defendant.

[Endorsements]: No. 11 (13). In Equity. In the U. S. District Court for the District of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Detroit Copper Mining Company of Arizona, [90] Defendant. Decree. Filed March 6, 1913, at 2:00 P. M. Allan B. Jaynes, Clerk.

[Decree in Case No. 12.]

In the District Court of the United States Within and for the District of Arizona.

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,
Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,
Defendant.

THIS CAUSE coming on to be finally heard at the October, A. D. 1912 Term of the said Court, upon the pleadings and proofs taken by and on be-

half of the respective parties hereto, and being argued by counsel for the respective parties; and the pleadings and proofs, and briefs and arguments of counsel having been taken under advisement, and the Court having duly considered the same and being now fully advised in the premises, it is on this 14th day of January, A. D. 1913, hereby ORDERED, ADJUDGED and DECREED as follows, to wit:

FIRST: That the letters patent referred to in the complainant's bill of complaint herein, being letters patent of the **[91]** United States of America, Numbered 590,675, issued and dated September 28th, A. D. 1897, and granted to Arthur R. Wilfley, for "certain new and useful improvements in ore concentrators," are, in all respects as regards and to the extent of the subject-matter of claims numbered (1), two (2) and seven (7) thereof (said first (1st), second (2nd) and seventh (7th) claims being the only ones as to which proof of infringement has been offered, and, therefore, the only ones considered by the Court) good and valid in law.

SECOND: That said Arthur R. Wilfley was the true original and first inventor of the improvements described in said United States letters patent No. 590,675, and claimed in said first (1st), second (2nd) and seventh (7th) claims thereof.

THIRD: That the Mine and Smelter Supply Company, the complainant in said bill of complaint therein, became, on or about the 12th day of October, A. D. 1905, the sole owner of said United States letters patent No. 590,675, by a good and sufficient assignment in writing from the said

Arthur R. Wilfley, duly recorded in the Patent Office of the United States; and that the sole and exclusive title to said letters patent, and all rights thereunder, are vested in the complainant as alleged in the said bill of complaint.

FOURTH: That the said defendant, Arizona Copper Company, **[92]** by the use of certain ore concentrators, or ore-concentrating tables, machines or apparatus containing and embodying the invention and improvements set forth, described and claimed in said United States letters patent No. 590,675 aforesaid, as alleged, set forth and shown in the bill of complaint and the proofs adduced herein, and as illustrated and shown by the certain drawings and photographs of the same introduced in evidence as exhibits, as well as by the "Full Size Deister Table Deck No. 1452" introduced in evidence by the complainant, has infringed, and such ore concentrators, or ore-concentrating tables, machines or apparatus do infringe said United States letters patent No. 590,675 to Arthur R. Wilfley, dated September 28th, A. D. 1897, as to claims numbered one (1), two (2) and seven (7) of the said recited United States letters patent No. 590,-675, and thereby the said defendant, Arizona Copper Company, has infringed and violated the exclusive rights of the complainant therein and thereunder, to the extent of and in respect to the said first (1st), second (2nd) and seventh (7th) claims, and each thereof, of the said letters patent No. 590,675.

FIFTH: AND IT IS FURTHER ORDERED, ADJUDGED AND DECREED, that the defendant, Arizona Copper Company, its officers, directors, agents, attorneys, servants, employees, workmen and associates, and every and all persons claiming or holding under or through it, and each and every of them, be, and it and they **[93]** are hereby perpetually enjoined and restrained from either directly or indirectly making, constructing, using or vending to others to be used, the said ore concentrators, or ore-concentrating tables, machines or apparatus complained of in the said bill of complaint herein, or any ore concentrators, or ore-concentrating tables, machines or apparatus constructed and operated in the manner, or substantially the manner and upon the principles described and illustrated in said letters patent of the United States of America No. 590,675, dated September 28th, A. D. 1897, and claimed in the first (1st), second (2nd) and seventh (7th) claims thereof, or either of them; and specifically from making, using or vending to others to be used, any transversely inclined concentrating table or surface, having a movement imparted thereto the tendency of which is to advance the material being treated upon its surface longitudinally forward from the head or mechanism end toward the foot or concentrate discharge end of such table or surface, said table or surface being provided with a number or plurality of riffles extending longitudinally a portion of the distance from its head end towards its foot end, said riffles varying in length so that the tips or terminals

thereof advance one beyond the other continuously and substantially along a line diagonal to the direction of the movement imparted to such table or surface from the upper or feed **[94]** side to the lower or tailing discharge side thereof, such table or surface having a sufficiently smooth, plain or unriffled surface or area, for the purpose set forth, described and illustrated in the specification, drawings and claims of the said United States letters patent No. 590,675 to Arthur R. Wilfley, located at the extremities of the riffles and adapted to receive the material caught by them as it leaves the riffles, and to subject said material to the side-wash of the wash-water and repeated washings described in the specification of said patent, as the same passes along the said diagonally advancing terminals of such riffles; and from doing any act or thing in infringement of the said first (1st), second (2nd) and seventh (7th) claims of the said United States letters patent No. 590,675, or in violation of the exclusive rights so as aforesaid vested in said complainant therein and thereunder; and it is hereby ORDERED that the writ of permanent and perpetual injunction be issued out of and under the seal of this Court accordingly.

SIXTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the complainant recover of the said defendant, Arizona Copper Company, the profits, gains and advantages which the said defendant has received or made, or which have arisen or accrued to it from such infringement, and in violation *or* complainant's rights, by the use of

the improvements in ore concentrators, or [95] ore-concentrating tables, machines or apparatus described in and secured by said United States letters patent No. 590,675, and claimed in claims numbered one (1), two (2) and seven (7) thereof, since the 12th day of January, A. D. 1910; and also that the complainant recover the damages which it has sustained by reason of said infringement from and after said date.

SEVENTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED, that this cause be referred to Ben M. Crawford, a Master of this Court, to ascertain and take and report to the Court an account of the gains, profits and advantages which the said defendant, Arizona Copper Company, has received, or which have arisen or accrued to it since the 12th day of January, A. D. 1910, from infringing the said exclusive rights of the said complainant by the use of the said improvements in ore concentrators, or ore-concentrating tables, described and secured by claims numbered one (1), two (2) and seven (7) of the said letters patent No. 590,675, and to ascertain and report the damages which the said complainant has sustained by said infringement, from the papers and evidence in this cause, and from any evidence which either party may produce before him of the same; and when he shall have had an account of said gains, profits and advantages, and assessed the damages therefor, he shall return the same to this Court for further action in the premises.

[96] EIGHTH: IT IS FURTHER ORDERED, ADJUDGED AND DECREED that the complainant on such accounting have the right to cause an examination of the officers, directors and employees of the said defendant corporation, *ore tenus* or otherwise, and also the production of the books, vouchers and documents of said defendant corporation, and that the officers, directors and employees of said defendant corporation attend before the said Master from time to time as said Master shall direct.

NINTH: IT IS FURTHER ORDERED that the question of increase of damages and all other matters not herein provided, be reserved until the coming in of the Master's report.

TENTH: IT IS FURTHER ORDERED that the parties and the Master may apply upon due notice to the Court, for such further order or instruction as may be necessary, at the foot of this decree.

ELEVENTH: AND IT IS FURTHER ORDERED, ADJUDGED, AND DECREED that the complainant recover of said defendant, Arizona Copper Company, its costs, charges and disbursements in this suit, to be taxed.

DONE in open Court at Phoenix, Arizona, this 14th day of January, A. D. 1913.

By the Court:

RICHARD E. SLOAN,
District Judge.

[97] We consent to the foregoing form of entry in said cause.

TAYLOR and HULSE,
Solicitor and of Counsel for the Defendant.

[Endorsements]: No. 12 (18). In Equity. In the United States District Court for the District of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Arizona Copper Company, Defendant. Decree. Filed March 6, 1913, at 2:00 P. M. Allan B. Jaynes, Clerk.

In the District Court of the United States Within and for the District of Arizona.

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Notice of Application to Tax Costs [in Case No. 11].

To the Defendant in the Above-entitled Cause, and Messrs. Taylor and Hulse, its Solicitors and Counsel Therein:

YOU WILL PLEASE TAKE NOTICE that on ———, the ——— day of ————, A. D. 1913, at the hour of ——— o'clock A. M., or as soon thereafter as counsel can be heard, counsel for the complainant in the above-entitled cause will [98] present and file with the Clerk of said United States District Court, at the courtroom of said Court in the city of Phoenix, County of Maricopa, State of Arizona, a memorandum of costs and disbursements

necessarily incurred by said complainant in the above-entitled action, and shall then and there make application for the taxation of the same as costs in said action against the said defendant; when and where you may attend and be heard, if you so desire.

A copy of the said memorandum of costs and necessary disbursements so to be presented and filed as aforesaid, supported by the affidavit of George L. Hodges, Esq., one of counsel for complainant, is herewith delivered to you.

Dated at Denver, Colorado, this 17th day of February, A. D. 1913.

GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors and Counsel for Complainant.

SERVICE of the above and foregoing Notice of Application to Tax Costs, together with a copy of Complainant's Memorandum of Costs and Necessary Disbursements therein referred to, by receipt of true copies thereof at Fort Wayne, Indiana, on this 21st day of February, A. D. 1913, at the hour of 2 o'clock P. M., is hereby acknowledged.

TAYLOR and HULSE,
_____,
Solicitors and Counsel for Defendant.

[99] [Endorsements]: No. 11 (14). In Equity. In the U. S. District Court for the District of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Detroit Copper Mining Company of Arizona, Defendant. Notice of Application to Tax Costs. Filed March 6, 1913. Allan B. Jaynes, Clerk.

In the United States District Court Within and for the District of Arizona.

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Notice of Application to Tax Costs [in Case No. 12].

To the Defendant in the above-entitled cause, and Messrs. Taylor and Hulse, its Solicitors and Counsel Therein:

YOU WILL PLEASE TAKE NOTICE that on ———, the ——— day of ————, A. D. 1913, at the hour of ——— o'clock, or as soon thereafter as counsel can be heard, counsel for the complainant in the above-entitled cause will present and file with the Clerk of said United States District Court, at the [100] courtroom of said Court in the City of Phoenix, County of Maricopa, State of Arizona, a memorandum of costs and disbursements necessarily incurred by said complainant in the above-entitled action, and shall then and there make application for the taxation of the same as costs in said action against the said defendant; when and where you may attend and be heard if you so desire.

A copy of the said memorandum of costs and necessary disbursements so to be presented and filed as aforesaid, supported by the affidavit of George L.

Hodges, Esq., one of counsel for complainant, is herewith delivered to you.

Dated at Denver, Colorado, this 17th day of February, A. D. 1913.

GEORGE L. HODGES.
D. EDGAR WILSON,
Solicitors and Counsel for Complainant.

SERVICE of the above and foregoing Notice of Application to Tax Costs, together with a copy of Complainant's Memorandum of Costs and Necessary Disbursements therein referred to, by receipt of true copies thereof at Fort Wayne, Indiana, on this 21st day of February, A. D. 1913, at the hour of 2 o'clock P. M., is hereby acknowledged.

TAYLOR and HULSE,
_____,
Solicitors and Counsel for Defendant.

[101] [Endorsements]: No. 12. (19.) In Equity. In the U. S. District Court for the District of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Arizona Copper Company, Defendant. Notice of Application to Tax Costs. Filed March 6, 1913. Allan B. Jaynes, Clerk.

[Memorandum of Costs and Disbursements in Case No. 11.]

In the District Court of the United States Within and for the District of Arizona.

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Memorandum of Costs and Necessary Disbursements of the Complainant in the Above-entitled Cause, and Application for the Taxation of Same as Costs Herein Against the Defendant, Together With Affidavit in Support Thereof.

Comes now the complainant in the above-entitled cause, by George L. Hodges and D. Edgar Wilson, its solicitors and counsel herein, and presents its Memorandum of Costs and Necessary Disbursements incurred in the above-entitled action, as hereinafter set forth, and hereby makes application for the taxation of the [102] same as costs herein against the said defendant, to wit:

To fee for attendance at trial.....$20.00

To costs for each pleading filed:

Bill for Complaint..... 3.00

Replication..... 3.00

To U. S. Marshal's fees..... 39.15

Together with such Clerk's costs charged to complainant and properly taxable herein $30.00 deposited by complainant..... 31.38

Total.....$95.53

The total amount claimed by the complainant herein for costs, exclusive of the Clerk's costs to be taxed, being the sum of Sixty-five Dollars and Fifteen Cents ($65.15).

GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors and Counsel for Complainant.

State of Colorado,
City and County of Denver,—ss.

George L. Hodges, being first duly sworn, upon his oath deposes and says: That he is one of counsel for the Complainant in the above-entitled action; that he has read the above and foregoing memorandum of costs and [103] necessary disbursements of the complainant in the above-entitled cause, and is familiar therewith, and knows that the items thereof are correct and that the disbursements therein mentioned have been necessarily incurred in the said action or proceeding on behalf of the said complainant.

GEORGE L. HODGES.

Subscribed and sworn to before me, this 17th day of February, A. D. 1913.

My Commission expires April 16th, 1916.

[Seal] DARWIN T. MASON,
Notary Public.

[Endorsements]: No. 11. (15.) In Equity. In the United States District Court for the District of

Arizona. The Mine and Smelter Supply Company, Complainant, vs. Detroit Copper Mining Company of Arizona, Defendant. Memorandum of Costs of Complainant and Application to Tax Same. Filed March 6, 1913. Allan B. Jaynes, Clerk.

[Memorandum of Costs and Disbursements in Case No. 12.]

In the District Court of the United States Within and for the District of Arizona.

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

[104] MEMORANDUM OF COSTS AND NECESSARY DISBURSEMENTS OF THE COMPLAINANT IN THE ABOVE-ENTITLED CAUSE, AND APPLICATION FOR THE TAXATION OF SAME AS COSTS HEREIN AGAINST THE DEFENDANT, TOGETHER WITH AFFIDAVIT IN SUPPORT THEREOF.

Comes now the complainant in the above-entitled cause, by George L. Hodges and D. Edgar Wilson, its solicitors and counsel herein, and presents its Memorandum of Costs and Necessary Disbursements incurred in the above-entitled action, as hereinafter set forth, and hereby makes application for the taxation

of the same as costs herein against the said defendant, to wit:

To fee for attendance at trial.....$ 20.00
To costs for each pleading filed:
Bill of Complaint..... 3.00
Replication..... 3.00
To attorneys' fee for each deposition taken on behalf of complainant:
Walter H. Bunce..... 2.50
John M. Callow..... 2.50

Amount to forward.....$ 31.00
To amount forwarded.....$ 31.00
To attorneys' fee for each deposition (continued):
Henry Eggers, two depositions..... 5.00
Clarence I. Glassbrook..... 2.50
Vernon E. Hodges, two depositions....$ 5.00
[105] Robert H. Richards, three depositions..... 7.50
Jesse C. Scobey..... 2.50
Charles E. Thompson..... 2.50
Arthur R. Wilfley..... 2.50
To witness fees for each witness produced and examined on behalf of complainant, at $1.50 per diem:
Walter H. Bunce, 1 day..... 1.50
John M. Callow, 1 day..... 1.50
Henry Eggers, 3 days..... 4.50
Clarence I. Glassbrook, 3 days..... 4.50
Vernon E. Hodges, 6 days..... 9.00
Robert H. Richards, 7 days..... 10.50

Jesse C. Scobey, 3 days.....	4.50
Charles E. Thompson, 1 day.....	1.50
Arthur R. Wilfley, 2 days.....	3.00
To fees of Special Examiners taking depositions of witnesses on behalf of complainant at the rate of $5.00 per diem:	
Special Examiner John D. Yoakley, 5 days	25.00
Special Examiner Almon E. Hart, 15 days.....	75.00
To fees for depositions of witnesses taken as aforesaid:	
Amount to forward.....$199.00	
[106] To amount forwarded...$199.00	
Before Special Examiner John D. Yoakley, 330 folios at 20 cents per folio..	66.00
Before Special Examiner Almon E. Hart, 1011 folios, at 20¢ per folio...	202.20
John D. Yoakley, swearing and certificate to 1 witness at .75¢.....	.75
Almon E. Hart, swearing and certificates to 12 witnesses and depositions at .75¢.....	9.00
To Marshal's fees....	32.08
Together with such Clerk's costs charged to complainant and properly taxable herein, $30.00 deposited by complainant.....	25.46

The total amount claimed by the complainant herein for costs, exclusive of the Clerk's costs to be taxed,

being the sum of five hundred and nine dollars and three cents.....($509.03)

Clerk..... 25.46

Total....$534.49

GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors and Counsel for Complainant.

[107] State of Colorado,
City and County of Denver,—ss.

George L. Hodges, being first duly sworn, upon his oath deposes and says: That he is one of counsel for the complainant in the above-entitled action; that he has read the above and foregoing memorandum of costs and necessary disbursements of the complainant in the above-entitled cause, and is familiar therewith, and knows that the items thereof are correct, and that the disbursements therein mentioned have been necessarily incurred in the said action or proceeding on behalf of the said complainant.

GEORGE L. HODGES.

Subscribed and sworn to before me this 17th day of February, A. D. 1913.

My commission expires April 16th, 1916.

[Seal] DARWIN T. MASON,
Notary Public.

In response to the objection of counsel for defendant to allowance of $5.00 per diem to Special Examiners, we submit that these Special Examiners were authorized, pursuant to stipulation entered into between counsel (See Stipulation on page 17, Com-

plainant's Printed Record), to act the same and as fully to all intents and purposes as if duly appointed and commissioned by the Court, etc. By agreement off the record each side was to [108] pay one-half of a $10.00 per diem to the special examiners, which complainant did, and which was part of complainant's costs in taking the depositions. We believe we are entitled to taxation accordingly, and also under the rules and usual practice.

HODGES & WILSON,
Solicitors and Counsel for Complainant.

Denver, Colorado, March 3, 1913.

We object to the allowance to Special Examiners, John D. Yoakley and Almon E. Hart, of $5.00 per diem, and in addition thereto of $286.20 for taking the testimony. We know of no statute authorizing it.

TAYLOR & HULSE,
Solicitors and Counsel for the Arizona Copper Company.

Ft. Wayne, Indiana, Feb. 28, 1913.

[Endorsements]: No. 12 (20). In Equity. In the U. S. District Court for the District of Arizona. The Mine and Smelter Supply Company, Complainant, vs. Arizona Copper Company, Defendant. Memorandum of Costs of Complainant and Application to Tax Same. Filed March 6, 1913. Allan B. Jaynes, Clerk.

[109] *In the District Court of the United States Within and for the District of Arizona.*

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

Prayer for Appeal and Assignment of Errors [of Detroit Copper Min. Co.].

The said defendant, the Detroit Copper Mining Company of Arizona, a corporation, feeling aggrieved by the decision pronounced by said Court in said cause in favor of the plaintiff therein, prays an appeal therefrom to the United States Circuit Court of Appeals for the Ninth Circuit and asks the Court to grant the said appeal and fix the amount of bond to be given by said defendant on such appeal. Said defendant further prays determination of said appeal.

And as ground for said appeal the said defendant assigns the following errors in the judgment and proceedings of said Court:

1. The Court erred in holding that the Deister Concentrating Table No. 2, the machine which was the subject of the litigation, was an infringement of the patent in suit.

[110] The Court erred in holding that the low and

diagonally deflected riffles on the said Deister Concentrator No. 2 were an essential feature of said Deister Concentrator.

3. The Court erred in holding that the diagonal deflection of the ends of the riffles on the Deister Concentrator was the mechanical equivalent of the advancing terminal arrangement of the riffles on the Wilfley table.

4. The Court erred in its construction of the claims of the Wilfley patent in suit.

5. The Court erred in holding that it was a want of foresight in Wilfley to limit his claims as he did.

6. The Court erred in holding that in view of the history and importance of the Wilfley patent in suit it should be construed notwithstanding the language used by the inventor as covering the appropriation of this essential feature of the Wilfley table.

7. The Court erred in denying the defendant's petition for rehearing.

8. The Court erred in rendering judgment for the plaintiff.

ROBERT S. TAYLOR,
ELWIN M. HULSE,
Solicitors for Defendant.

[111] [Endorsements]: No. 11. In Equity. Mine and Smelter Supply Company vs. Detroit Copper Mining Company of Arizona. Prayer for Appeal and Assignment of Errors. Filed May 10, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

[Petition of Arizona Copper Co. for Allowance of Appeal.]

In the District Court of the United States, Within and for the District of Arizona.

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

The said defendant, the Arizona Copper Company, a corporation, feeling aggrieved by the decision pronounced by said court in said cause in favor of the plaintiff therein, prays an appeal therefrom to the United States Circuit Court of Appeals for the Ninth Circuit, and asks the Court to allow the said appeal and fix the amount of bond to be given by said defendant on such appeal. Said defendant further prays the Court to stay all proceedings under said judgment until the determination of said appeal.

[Assignment of Errors by Arizona Copper Co.]

[112] And as ground for said appeal the said defendant assigns the following errors in the judgment and proceedings of said court:

1. The Court erred in holding that the Deister Concentrating Table No. 2, the machine which was the subject of the litigation was an infringement of the patent in suit.

2. The Court erred in holding that the low and

diagonally deflected riffles on the said Deister Concentrator No. 2 were an essential feature of said Deister Concentrator.

3. The Court erred in holding that the diagonal deflection of the ends of the riffles on the Deister concentrator was the mechanical equivalent of the advancing terminal arrangement of the riffles on the Wilfley table.

4. The Court erred in its construction of the claims of the Wilfley patent in suit.

5. The Court erred in holding that it was a want of foresight in Wilfley to limit his claim as he did.

6. The Court erred in holding that in view of the history and importance of the Wilfley patent in suit it should be construed notwithstanding the language used by the inventor as covering the appropriation of this essential feature of the Wilfley table.

7. The Court erred in denying the defendant's petition for rehearing.

8. The Court erred in rendering judgment for the plaintiff.

[113] ROBERT S. TAYLOR,
EDWIN M. HULSE,
Solicitors for Defendant.

[Endorsement]: No. 12. In Equity. Mine and Smelter Supply Company vs. Arizona Copper Company. Petition for Appeal. Filed May 10, 1913. Allan B. Jaynes, Clerk.

[Motion in Case No. 11 for Extension of Time to Prepare Transcript, etc.]

[114] *In the District Court of the United States for the District of Arizona.*

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

The above-named defendant, the Detroit Copper Mining Company of Arizona, represents to the Court that it has taken an appeal from the decision of this court to the United States Circuit Court of Appeals for the Ninth Circuit, as appears on the record; that in obedience to paragraph (b) of rule 75 of the new rules in equity, this defendant as appellant is required to set forth in simple and condensed form all the evidence in said record, which is a duty imposing upon the defendant's counsel a great labor requiring much time, the record of the evidence in this case occupying 429 large printed pages; that its counsel has been engaged with all possible diligence upon that work, and is expecting now to have the record of said cause in the condensed form required by the rule finished and lodged in the clerk's office about June 4th, 1913, after which the plaintiff will be entitled to a hearing upon the subject of the state-

ment submitted [115] by the defendant; that this unavoidable delay will make it impossible for the clerk to prepare a transcript within thirty days from the day of signing the citation in said cause, as required by the rules of this court. Wherefore, said defendant prays the Court to grant an extension of forty days time, if it should be required, for the clerk to comply with the rule of this court.

DETROIT COPPER MINING COMPANY OF ARIZONA.

By R. S. TAYLOR,
E. M. HULSE,
Its Solicitors.

In the District Court of the United States for the District of Arizona.

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Motion [in Case No. 12] for Extension of Time to Clerk for Filing Transcript.

And now comes the Arizona Copper Company, defendant in said cause, and shows to the Court that it, too, has taken an [116] appeal from the decision of this court to the United States Circuit Court of Appeals for the Ninth Circuit, as appears by the record, and that all the foregoing facts stated by the

Detroit Copper Mining Company of Arizona apply to this case; that the two cases are by the same plaintiff and for infringement of the same claims of the same patent by the use of the same thing; that by agreement of counsel during the progress of said cause only one record was made up, which was to apply to both cases alike; wherefore, the said defendant prays that the same order may be made to apply to both cases alike.

ARIZONA COPPER COMPANY.
By R. S. TAYLOR,
E. M. HULSE,
Its Solicitors.

[Endorsements]: #11 and #12. In Equity. Motion for Extension of Time to Clerk for Filing Transcript. Mine and Smelter Supply Company vs. Detroit Copper Mining Company and Mine and Smelter Supply Company vs. Arizona Copper Company. Filed May 31, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

In the United States Circuit Court of Appeals for the Ninth Circuit.

[117] No. 11.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,
Appellant,
vs.
THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,
Appellee.

Order Extending Time to [July 3, 1913, to] File Record on Appeal [in Case No. 11] and to Docket Cause.

On motion of R. S. Taylor and E. M. Hulse, Esqs., solicitors for the Detroit Copper Mining Company of Arizona, a corporation, the above-named appellant, and good cause appearing therefor, it is

ORDERED, that the appellant have to and including the 3d day of July, 1913, within which to docket the cause and to file the record on appeal in the United States Circuit Court of Appeals for the Ninth Circuit.

Dated June 4th, 1913.

WM. W. MORROW,
United States Circuit Judge for the Ninth Circuit.

[Endorsements]: Detroit Copper Mining Company *Company*, Appellant, vs. Mine and Smelter Supply Company. Order Continued Time to Perfect Appeal. Filed June 6, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy. United States District Court for the District of Arizona.

[Order Extending Time to July 3, 1913, to Docket Cause and to File Record in Case No. 12 in Appellate Court.]

[118] *In the United States Circuit Court of Appeals for the Ninth Circuit.*

No. 12.

ARIZONA COPPER COMPANY, a Corporation, Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Appellee.

ORDER TO CONTINUE TIME TO PERFECT APPEAL.

On motion of R. S. Taylor and E. M. Hulse, Esqs., solicitors for the Arizona Copper Company, a corporation, the above-named appellant, and good cause appearing therefor, it is

ORDERED, that the appellant have to and including the 3d day of July, 1913, within which to docket the cause and to file the record on appeal in the United States Circuit Court of Appeals for the Ninth Circuit.

Dated June 4th, 1913.

WM. W. MORROW,

United States Circuit Judge for the Ninth Circuit.

[Endorsements]: No. 12. United States District Court, District of Arizona. Arizona Copper Company, Appellant, vs. Mine and Smelter Supply [119] Company. Order to Continue Time to Perfect Appeal. Filed June 6, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

[Stipulation for Transmission of Original Exhibits to Appellate Court.]

In the District Court of the United States for the District of Arizona.

#11 and#12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

APPEAL TO THE UNITED STATES CIRCUIT COURT OF APPEALS.

It is stipulated and agreed by counsel in said appeal that the printed volume on file entitled "Book of Complainant's Paper Exhibits, Drawings and Photographs" shall be transmitted by the clerk with the transcript to the United States Circuit Court of [120] Appeals for the Ninth Circuit as an exhibit, and that the Clerk shall also transmit with the record

such other exhibits as the parties may request.

GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors for Appellee.
ROBERT S. TAYLOR,
E. M. HULSE,
Solicitors for Appellant.

[Endorsements]: #11 and #12, in Equity. Mine and Smelter Supply Company vs. Detroit Copper Mining Company and Arizona Copper Company. Stipulation as to Exhibits. Filed June 9, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

In the United States District Court for the District of Arizona.

#11 and #12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Stipulation [That Clerk Transmit to Appellate Court One Transcript of Record Covering Cases Nos. 11 and 12, and That the Cases be Submitted Together as One Case].

[121] Whereas the above-named cases were brought by the same plaintiff in the same court for alleged infringement of the same claims of the same patent by use of the same thing, and by agreement of counsel all the testimony taken was applied in both cases alike, so that there is in existence only one record of the proceedings, and

Whereas each of said defendants has appealed from the judgment of said court against it to the United States Circuit Court of Appeals for the Ninth Circuit,—

It is therefore agreed and stipulated by counsel for the parties respectively that the Clerk shall prepare and transmit to the Clerk of the United States Circuit Court of Appeals one transcript of the record entitled in both of said cases and that they shall be submitted and argued in said Court of Appeals together as one case subject to any direction which the Court shall give in reference thereto.

GEORGE L. HODGES,
D. EDGAR WILSON,
For the Plaintiff.
R. S. TAYLOR,
E. M. HULSE,
For the Defendant.

[Endorsements]: #11 and #12, in Equity. Mine and Smelter Supply Company [122] vs. Detroit

Copper Mining Company and Arizona Copper Company. Stipulation. Filed June 9, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

No. 11.

THE MINE & SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY, a Corporation,

Defendant.

Transcript of the Minute Entries [in Case No. 11].

BE IT REMEMBERED, that heretofore and upon, to wit, the 7th day of October, A. D. 1912, the same being one of the regular juridical days of the October, 1912 Term of said court, the following order, *inter alia,* was had and entered of record in said court in said cause, which said order is in words and figures as follows, to wit:

[Order Setting Case for Trial in Case No. 11.]

11.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

It is ordered that this case be set for trial on Monday, November 18, 1912, at 10:00 o'clock A. M.

AND AFTERWARDS, and upon, to wit, the 18th day of November, A. D. 1912, the same being one of the regular juridical days of the October, 1912, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures, as follows, to wit:

[Trial in Case No. 11.]

[123] 11.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

This case came on this day regularly for hearing upon the report of the Master herein, George L. Hodges, Esquire, appearing as counsel for the plaintiff and E. M. Hulse, Esquire, for the defendant. It is hereby stipulated between counsel for the respective counsel in this case that the testimony taken in the case of The Mine and Smelter Supply Company, a Corporation, Plaintiff, vs. The Arizona Copper Mining Company, a Corporation, Defendant, No. 12 in this court, shall be considered as having been taken in this case. Argument of the respective counsel was had and the further trial was ordered continued until Tuesday, November 19, 1912, at 9:30 o'clock A. M.

AND AFTERWARDS, and upon, to wit, the 19th day of November, A. D. 1912, the same being one of

the regular juridical days of the November, 1912, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Trial (Resumed) in Case No. 11.]

11.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY, a Corporation,

Defendant.

This case having been continued from yesterday's session of this court, come now the same parties hereto, and the [124] further trial of the case proceeds as follows: Further argument of the respective counsel was had and the case being now fully submitted to the Court, the same was by the Court taken under advisement.

AND AFTERWARDS, and upon, to wit, the 14th day of January, A. D. 1913, the same being one of the regular juridical days of October, 1913, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order in Case No. 12 That Judgment be Entered.]

12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE ARIZONA COPPER COMPANY, a Corporation,

Defendant.

This case having been argued and fully submitted at a previous session of this court, and the Court now being fully advised in the premises orders that judgment be entered herein in favor of the plaintiff in accordance with the opinion signed and filed herein.

AND AFTERWARDS, and upon, to wit, the 7th day of April, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order of Submission of Motion for Rehearing [in Case No. 11.]

[125] 11.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY, a Corporation,

Defendant.

It is ordered by the Court that the motion of the defendant for a rehearing herein be submitted upon the briefs on file herein.

AND AFTERWARDS, and upon, to wit, the 14th day of April, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order Denying Petition for Rehearing in Case No. 11.]

11.

MINE AND SMELTER SUPPLY COMPANY,
a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY,
a Corporation,

Defendant.

The petition of the defendant for a rehearing herein having been heretofore fully submitted to the Court, and the Court being fully advised in the premises, does deny said petition.

AND AFTERWARDS, and upon, to wit, the 9th day of May, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said court, the following order, *inter alia,* was had and entered of record [125a] in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order Allowing Appeal, etc., in Case No. 11.]

11.

MINE AND SMELTER SUPPLY COMPANY,
a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY,
a Corporation,

Defendant.

Comes now the defendant and prays an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from the judgment rendered against it on the 14th day of January, 1913, and shows to the Court that it has paid into the hands of the clerk of this court one Thousand Five Hundred Dollars in money, to stand as security in lieu of bond on such appeal. And it is ordered by the Court that said appeal be allowed and said deposit of money accepted in lieu of bond as security to be forfeited to the plaintiff, or so much thereof as shall be necessary for its indemnity, if the defendant shall fail to make good its plea on such appeal. And it is ordered, further, that the clerk deposit said sum of One Thousand Five Hundred Dollars so paid to him in the registry of the court until the further order of the Court.

AND AFTERWARDS, and upon, to wit, the 10th day of May, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said [126]

cause, which said order is in words and figures as follows, to wit:

[Order Allowing Appeal, etc., in Case No. 11.]

11.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY, a Corporation,

Defendant.

Comes now the defendant by counsel and prays an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from the judgment rendered against it on the 14th day of January, 1913, and shows to the Court that it has filed a prayer for appeal and assignment of errors herein and paid into the hands of the Clerk of the court the sum of One Thousand Five Hundred Dollars, to stand as security in lieu of bond on such appeal. It is now, therefore, ordered by the Court that the said appeal be allowed and said deposit of money accepted in lieu of bond as security to be forfeited by the plaintiff, or so much thereof as shall be necessary for its indemnity, if the said defendant shall fail to maintain and make good its plea on such appeal. And it is further ordered that the clerk deposit said sum of One Thousand Five Hundred Dollars so paid to him in the registry of the court until the further order of the Court.

And it is further ordered that this order and all of the files relating thereto supersede the order of May

9th, 1913, allowing an appeal herein in so far as they may be in conflict therewith.

[127] No. 12.

THE MINE & SMELTER SUPPLY COMPANY,
a Corporation,
Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,
Defendant.

Transcript of the Minute Entries [in Case No. 12].

BE IT REMEMBERED, that heretofore and upon, to wit, the 7th day of October, A. D. 1912, the same being one of the regular juridical days of the October, 1912, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

12.

MINE AND SMELTER SUPPLY COMPANY,
a Corporation,
Plaintiff,

vs.

ARIZONA COPPER COMPANY OF ARIZONA,
a Corporation,
Defendant.

It is ordered that this case be set for trial on Monday, November 18, 1912, at 10:00 o'clock A. M.

AND AFTERWARDS, and upon, to wit, the 18th day of November, A. D. 1912, the same being one of the regular juridical days of the October, 1912, Term

of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Trial in Case No. 12.]

[128] 12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

This case came on this day regularly for hearing upon the report of the Master herein, George L. Hodges, Esquire, appearing as counsel for the plaintiff, and E. M. Hulse, Esquire, for the defendant. Argument of the respective counsel was had and the further trial of this case was ordered continued until Tuesday, November 19, 1912, at 9:30 o'clock A. M.

AND AFTERWARDS, and upon, to wit, the 19th day of November, A. D. 1912, the same being one of the regular juridical days of the October, 1912, Term of said court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Trial (Resumed) in Case No. 12.]

12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

This case having been continued from yesterday's session of this court, comes now the same parties hereto and the [129] further trial of the case proceeds as follows: Further argument of the respective counsel was had and the case being now fully submitted to the Court, the same was by the Court taken under advisement.

AND AFTERWARDS, and upon, to wit, the 14th day of January, A. D. 1913, the same being one of the regular juridical days of the October, 1913, Term of said Court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order in Case No. 11 That Judgment be Entered.]

11.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant.

This case having been argued and fully submitted at previous session of present term, and the Court now being fully advised in the premises, orders that judgment be entered herein in favor of the plaintiff in accordance with opinion signed and filed herein.

AND AFTERWARDS, and upon, to wit, the 7th day of April, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said Court, the following order, *inter alia*, was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order of Submission of Motion for Rehearing in Case No. 12.]

[130] 12.

MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

It is ordered by the Court that the motion of the defendant for a rehearing herein be submitted upon the briefs on file herein.

AND AFTERWARDS, and upon, to wit, the 14th day of April, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said Court, the following order, *inter alia,* was had and entered of record in said court, in said cause, which said order is in words and figures as follows, to wit:

[Order Denying Petition for Rehearing in Case No. 12.]

12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

The petition of the defendant for a rehearing herein having been heretofore fully submitted to the Court, and the Court being fully advised in the premises, does deny said petition.

AND AFTERWARDS, and upon, to wit, the 9th day of May, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said Court, the following order, *inter alia,* was had and entered of record in said Court, in said cause, which said order is in words and figures as follows, to wit: [131]

[Order Allowing Appeal, etc., in Case No. 12.]

12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Comes now the defendant and prays an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from the judgment rendered against it on the 14th day of January, 1913, and shows to the Court that it has paid into the hands of the clerk of this court One Thousand Five Hundred Dollars in money to stand as security in lieu of bond on such appeal. And it is ordered by the Court that said appeal be allowed and said deposit of money accepted in lieu of bond as security to be forfeited to the plaintiff, or so much thereof as shall be necessary for its indemnity, if the defendant shall fail to make good its plea on such appeal. And it is ordered further that the clerk deposit said sum of One Thousand Five Hundred Dollars so paid to him in the registry of the Court until the further order of the Court.

AND AFTERWARDS, and upon, to wit, the 10th day of May, A. D. 1913, the same being one of the regular juridical days of the April, 1913, Term of said Court, the following order, *inter alia,* was had and entered of record in said court, in said [132] cause which said order is in words and figures as follows, to wit:

[Order Allowing Appeal, etc., in Case No. 12.]

12.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

THE ARIZONA COPPER COMPANY, a Corporation,

Defendant.

Comes now the defendant by counsel and prays an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from the judgment rendered against it on the 14th day of January, 1913, and shows to the Court that it has filed a prayer for appeal and assignment of errors herein and paid into the hands of the Clerk of the Court the sum of One Thousand Five Hundred Dollars to stand as security in lieu of bond on such appeal. And it is now ordered by the Court that the said appeal be allowed and said deposit of money accepted in lieu of bond as security to be forfeited by the plaintiff, or so much thereof as shall be necessary for its indemnity, if the said defendant shall fail to maintain and make good its plea on such appeal. And it is further ordered that the clerk deposit said sum of One Thousand Five Hundred Dollars so paid to him in the registry of the court until the further order of the Court.

And it is further ordered that this order and all of the files relating thereto supersede the order of May 9th, 1913, allowing an appeal herein in so far as they may be in conflict therewith.

[Citation on Appeal in Case No. 11.]

[133] *In the United States District Court for the District of Arizona.*

No. 11.

UNITED STATES OF AMERICA,—ss.

The President of the United States of America, to the Mines and Smelter Supply Company, a Corporation:

You and each of you are hereby cited and admon-

ished to appear in the United States *Circuit of* Appeals for the Ninth Judicial Circuit within thirty (30) days from the date of this writ, pursuant to the appeal duly obtained and filed in the Clerk's office of the United States District Court for the District of Arizona, wherein you are appellees and Detroit Copper Mining Company of Arizona is the appellant, to show cause, if any there be, why the order and decree in said appeal mentioned should not be done to the parties in that behalf, and to do and receive that may appertain to justice to be done in the premises.

WITNESS, The Honorable WM. W. MORROW, Judge United States Circuit Court of Appeals, Presiding as Judge of the United States District Court for the District of Arizona, this 15th day of May, 1913.

WM. W. MORROW,
Judge.

[134] United States of America,
District of Colorado,—ss.

I hereby certify that I have duly executed the within writ as follows, to wit:

As to the Mines and Smelter Supply Company by delivering to Albert H. Seep, personally, as the Vice-President of the said The Mines and Smelter Supply Company, a true copy of the within writ at Denver, in said District, on the 12th day of June, A. D. 1913.

D. C. BAILEY,
U. S. Marshal.
By E. B. Chadwick,
Deputy.

Fees and Costs: $2.00.

[Endorsements]: #11. Marshal's No. 4232. United States District Court, District of Arizona. Citation. Filed June 17, 1913. Allan B. Jaynes, Clerk.

[Citation on Appeal in Case No. 12.]

In the United States District Court for the District of Arizona.

No. 12.

[135] UNITED STATES OF AMERICA,—ss.

The President of the United States of America, to The Mines and Smelter Supply Company, a Corporation:

You and each of you are hereby cited and admonished to appear in the United States *Circuit of* Appeals for the Ninth Judicial Circuit, within thirty (30) days from the date of this writ, pursuant to the appeal duly obtained and filed in the Clerk's office of the United States District Court for the District of Arizona, wherein you are appellees and Arizona Copper Company is the appellant, to show cause, if any there be, why the order and decree in said appeal mentioned should not be reversed and corrected and why speedy justice should not be done to the parties in that behalf, and to do and receive that may appertain to justice to be done in the premises.

WITNESS, the Honorable WM. W. MORROW, Judge United States Circuit Court of Appeals, Presiding as Judge of the United States District Court for the District of Arizona, this 15th day of May, 1913.

WM. W. MORROW,
Judge.

United States of America,
District of Colorado,—ss.

I hereby certify that I have duly executed the within writ as follows, to wit:

As to The Mines and Smelter Supply Company, by delivering to [136] Albert H. Seep, personally, as the Vice-President of the said The Mines and Smelter Supply Company, a true copy of the within writ at Denver, in said District, on the 12th day of June, A. D. 1913.

Fees and Costs: $2.00.

D. C. BAILEY,
U. S. Marshal.
By E. B. Chadwick,
Deputy.

[Endorsements]: #12. Marshal's No. 4233. United States District Court, District of Arizona. Citation. Filed June 17, 1913. Allan B. Jaynes, Clerk.

In the United States Circuit Court of Appeals for the Ninth Circuit.

No. 11.

THE DETROIT COPPER MINING COMPANY, a Corporation,

Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Appellee.

Order Extending Time to [August 4, 1913, to] Perfect Appeal [in Case No. 12].

[137] On motion of R. S. Taylor, Esq., and E. M. Hulse, Esq., solicitors for the Detroit Copper Mining Company, a corporation, the above-named appellant, in good cause appearing therefor, it is ordered that the appellant have to and including the 4th day of August, 1913, within which to docket the cause and to file a record on appeal in the United States Circuit Court of Appeals for the Ninth Circuit.

Dated this 28th day of June, 1913.

WM. W. MORROW,
United States Circuit Judge for the Ninth Circuit.

[Endorsements]: No. 11. United States District Court, District of Arizona. Mine and Smelter Supply Company, a Corporation, Plaintiff, vs. Detroit Copper Mining Company, a Corporation, Defendant. Order Extending Time to Perfect Appeal. Filed June 30, 1913. Allan B. Jaynes, Clerk.

In the United States Circuit Court of Appeals for the Ninth Circuit.

No. 12.

ARIZONA COPPER COMPANY, a Corporation,
Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,
Appellee.

Order Extending Time to [August 4, 1913] to Perfect Appeal [in Case No. 12].

[138] On motion of R. S. Taylor, Esq., and E. M. Hulse, Esq., solicitors for the Arizona Copper Company, a corporation, the above-named appellant, in good cause appearing therefor, it is ordered that the appellant have to and including the 4th day of August, 1913, within which to docket the cause and to file a record on appeal in the United States Circuit Court of Appeals for the Ninth Circuit.

Dated this 28th day of June, 1913.

WM. M. MORROW,
United States Circuit Judge for the Ninth Circuit.

[Endorsements]: No. 12. United States District Court, District of Arizona. Mine and Smelter Supply Company, a Corporation, Plaintiff, vs. Arizona Copper Company, a Corporation, Defendant. Order Extending Time to Perfect Appeal. Filed June 30, 1913. Allan B. Jaynes, Clerk. By F. E. McCrary, Deputy.

[Notice of Motion for Order Approving Condensed Testimony.]

[139] *In the District Court of the United States for the District of Arizona.*

Nos. 11 and 12.

THE MINE AND SMELTER SUPPLY COMPANY,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA,

and

THE MINE AND SMELTER SUPPLY COMPANY,

Plaintiff,

vs.

ARIZONA COPPER COMPANY,

Defendant.

To Hodges and Wilson, Solicitors for the Plaintiff in Said Causes, Denver, Colorado.

Gentlemen:—

You are hereby notified that on June 5, 1913, we lodged in the office of the clerk of said court at Phoenix, Arizona, a copy of the testimony contained in the record in said causes, condensed and simplified as required by paragraph (b) of Equity rule 75; and that on Saturday, June 21, 1913, we shall ask the Court, or if the Court should not be in session, the Judge thereof, to approve the said statement so filed; and you are further notified, in case you desire to present any objections to or amendments of said statement to present them at that time and place.

[140] TAYLOR & HULSE,
Solicitors for Defendant.

Service of the foregoing notice acknowledged this 10th day of June, 1913, at Denver, Colorado.

GEORGE P. HODGES.
D. EDGAR WILSON.

[Endorsements]: Nos. 11 and 12. United States District Court, District of Arizona. Mine and Smelter Supply Company vs. Detroit Copper Mining

Company of Arizona, and Arizona Copper Company. Filed June 17, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

[Stipulation Waiving Examination of Condensed and Simplified Statement That Clerk Prepare Record on Appeal in Accordance With Praecipe, etc.]

[141] *United States District Court for the District of Arizona.*

Nos. 11 and 12.

MINE AND SMELTER SUPPLY COMPANY

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA,

and

MINE AND SMELTER SUPPLY COMPANY

vs.

ARIZONA COPPER COMPANY.

STIPULATION IN RELATION TO APPEAL.

WHEREAS, judgment for the plaintiff was lately rendered by said court in each of said above-named causes, and

WHEREAS, each of said defendants has prayed an appeal to the United States Circuit Court of Appeals for the Ninth Circuit from the judgment so rendered against it; and

WHEREAS, the said two suits were for alleged infringement of the same patent, viz., U. S. patent No. 590,675 to Arthur R. Wilfley, dated September

28, 1897, by use of a number of ore concentrators of identically similar construction and operation, to wit, a concentrating table known as Deister Concentrator No. 2; and

WHEREAS, in the taking of the proofs in said two causes **[142]** it was agreed by the solicitors for the parties respectively, namely, Hodges and Wilson for the plaintiff, and Taylor and Hulse for the defendants, that the same proofs should be taken as applying to both cases, so that there is in fact only one record of testimony for the two cases; and

WHEREAS, said Taylor and Hulse, as solicitors for said appellants, prepared and lodged in the office of the Clerk of said District Court on the 5th day of June, 1913, a statement in condensed and simplified form of the testimony of witnesses contained in said record put in narrative form, said statement covering what form nearly all said testimony, but including also a relatively small portion thereof which counsel considered ought to be reproduced in the exact words of the witness; all in conformity with the requirements of paragraph (b) of Equity Rule 75; and

WHEREAS, said Taylor and Hulse duly notified said Hodges and Wilson of such lodgment, and named in such notice June 21, 1913, as the time, and the office of the clerk of said District Court as the place where they would ask the court or Judge to approve said statement; and

WHEREAS, said Taylor and Hulse at the time of filing said condensed and simplified statement of testimony filed also a praecipe in the office of the Clerk

of said court indicating the [143] portions of the record to be incorporated into the transcript on such appeal; and

WHEREAS, said Taylor and Hulse at the time of sending said statement to said Clerk also sent a copy of the same to said Hodges and Wilson, as solicitors for the plaintiff, which copy was duly received by them; and

WHEREAS, afterwards, and before the date named in said notice, said Hodges and Wilson as solicitors for the plaintiff prepared and lodged in the office of the Clerk of said court a condensed and simplified statement in narrative form of portions of the testimony of witnesses contained in said record additional to the portions embraced in said statement prepared by counsel for the appellants as aforesaid, the greater portion of said statement being in narrative form, but including also a relatively small portion of the evidence which counsel considered ought to be reproduced in the exact words of the witnesses, all in conformity with paragraph (b) of Equity Rule 75; and

WHEREAS, neither of the parties has any objection to offer to the condensed and simplified statement of testimony in the record proposed by the other, so that upon the whole they are in agreement on that subject, and it does not appear to them to be necessary to put upon the court or the Judge thereof the burden of examining said statements and comparing them with the record;

[144] NOW, THEREFORE, it is stipulated and agreed by and between the said parties appellant

and appellee as follows:

1. That the court or Judge thereof whose duty it would be in the absence of agreement between the parties to examine the said condensed and simplified statements and compare them with the record, be respectfully requested to accept this agreement of the parties in the place of such examination, and to confirm the same by the entry of an order a draft of which will be presented to the Court with this agreement.

2. That the Clerk of said District Court be directed upon the making of said order to prepare a transcript of the record in accordance with the praecipe filed by the appellant and also in accordance with the praecipe filed by the appellee; that in preparing that part of the transcript containing the testimony as it has been condensed and simplified by the parties he shall copy after the name of each witness, first, the condensed and simplified statement of his testimony prepared and filed by counsel for the appellants; and follow that with the condensed and simplified statement of the testimony of the same witness prepared and filed by counsel for the appellee.

3. Said Clerk shall entitle the case in his transcript as it is entitled at the head of this paper, but make and certify it as a single record.

[145] ROBERT S. TAYLOR,
ELWIN M. HULSE,
Solicitors for Defendants-Appellants.
GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors for Plaintiff-Appellee.

[Endorsements]: Nos. 11 and 12. Mine and Smelter Supply Company vs. Detroit Copper Mining Company of Arizona and Arizona Copper Company. Stipulations in Relation to Appeal. Filed June 26, 1913. Allan B. Jaynes, Clerk. By F. E. McCrary, Deputy.

[Order Approving Condensed and Simplified Statement of Testimony.]

United States District Court for the District of Arizona.

MINE AND SMELTER SUPPLY COMPANY

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA,

and

MINE AND SMELTER SUPPLY COMPANY

vs.

ARIZONA COPPER COMPANY.

[146] Come the parties by their solicitors respectively, namely, Hodges and Wilson for the plaintiff, and Taylor and Hulse for the defendants, and show to the Court that in preparing the record in said causes for appeal to the United States Circuit Court of Appeals they have proceeded in all respects in obedience to Equity Rule 75, and by mutual agreement and understanding have made up and completed a condensed and simplified statement of the testimony of the witnesses contained in said record in accordance with said rule and request the Court to accept and approve the same, which is now done.

And it is thereupon ordered by the Court that the condensed and simplified statement of the testimony of the witnesses in said cases as so made up by the parties be and the same is approved by the Court as a complete and sufficient compliance with Equity Rule 75 and with the law in all respects.

WM. W. MORROW,
Judge U. S. Circuit Court of Appeals.

[Endorsements]: Nos. 11 and 12. United States District Court, District of Arizona. Mine and Smelter Supply Company, Plaintiff, vs. Detroit Copper Mining Company of Arizona, Defendant, and Arizona Copper Company, Defendant. Order Approving Condensed Statement. Filed July 2, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

[Defendant's Condensed Statement of Evidence.]

[147] *In the United States District Court Within and for the District of Arizona.*

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

CONDENSED STATEMENT OF THE EVIDENCE TO BE INCLUDED IN THE RECORD ON APPEAL PREPARED BY SOLICITORS FOR THE DEFENDANT IN COMPLIANCE WITH RULE 75 OF THE EQUITY RULES.

INTRODUCTION.

The following statement is made up from the volumes of the printed record, beginning with the volume entitled "Record of Pleadings, Stipulations and of Testimony taken on behalf of complainant."

It was stipulated by counsel that the uncertified printed copies of patents should be admitted on either side; that counsel introducing exhibits should retain possession of them until the hearing; and that the plaintiff has been the owner of the [148] patent in suit since about October 12, 1905.

[Complainant's Condensed Statement of Evidence.]

In the District Court of the United States for the District of Arizona.

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

FURTHER CONDENSED STATEMENT OF THE EVIDENCE TO BE INCLUDED IN THE RECORD ON APPEAL. PREPARED BY SOLICITORS FOR THE COMPLAINANT IN THE ABOVE-ENTITLED CAUSES, IN COMPLIANCE WITH RULE 75 OF THE EQUITY RULES.

[149] INTRODUCTION.

The following statement of the evidence to be included in the record on appeal is intended to supplement the condensed statement prepared by solicitors for the defendants, in accordance with the suggestions made by said solicitors for the defendants in their brief accompanying their said condensed statement.

Testimony of witnesses for complainant given in *prima facie* case taken from the printed record entitled, "Record of Pleadings and Stipulations and of Testimony taken on behalf of Complainant."

[Testimony of Henry Eggers, for Plaintiff.]

(Defendant's Condensed Statement.)

HENRY EGGERS, a witness for the plaintiff, states that he has had charge of the mining machinery sales of the Mine and Smelter Supply Company; has been familiar with the Wilfley concentrating table for something over two years; identifies "Complainant's Exhibit No. 1, Blue-print Wilfley Concentrating Table No. 10,685"; the blue-print represents the deck of the Wilfley table and the figures along lines H H, G G, F F, E E, D D, C C, B B and A A represent the heights of the riffle cleats

(Testimony of Henry Eggers.)

at the intersections with those lines in thousandths of an inch; identified "Complainant's Exhibit No. 2, cross-section Wilfley Concentrating Table No. 10,685"; it represents cross-sections taken at the lines referred to in Exhibit No. 1; identifies "Complainant's Exhibit No. 3, Model Wilfley [150] Table Deck"; states that it was not made on any definite scale but is a representation in outline of the construction of the Wilfley table as manufactured; counsel for plaintiff offers in evidence "Complainant's Exhibit No. 4, Wilfley Patent in Suit." Witness proceeds and states that he took measurements of one of the No. 2 Deister tables in use in the mill of the Arizona Copper Company at Morenci, Arizona, in July, 1910, and prepared a drawing from those measurements, a blue-print of which is marked "Complainant's Exhibit No. 5, Drawing Deister Table in No. 6 Mill of the Arizona Copper Company at Morenci, Arizona"; states that the exhibit marked "Complainant's Exhibit No. 6, Model Deister Table No. 2, Arizona Copper Company Mill No. 6, Morenci, Arizona," was made under his supervision; the direction of the vibrating movement in the Deister table is parallel with the riffles from head end to line B B; the distance from line A A to line B B is 10½ inches, and from line B B to end of long riffles 13 inches, and to end of short riffles 11 inches; identifies "Complainant's Exhibit No. 7, Combined Model of Wilfley and Deister Table" as prepared under his supervision; the width of the washwater board on the Deister table as constructed is 4½ inches and its

(Testimony of Henry Eggers.)

inclination 5/8ths of an inch; identifies "Complainant's Exhibit No. 8 Photograph Wilfley Table in Operation," and states that it fairly [151] represents the machine's operation under normal conditions.

Plaintiff

[Testimony of Robert H. Richards, for ~~Defendant.~~]

(Defendant's Condensed Statement.)

ROBERT H. RICHARDS states that he is Professor of Mining Engineering and Metallurgy in the Massachusetts Institute of Technology; began to teach in 1868; had charge of mining in 1873, and metallurgy in 1883; has made investigations as to working of tables in concentrating ore; is familiar with the Wilfley table; says the great advance made by Wilfley in his patent lay in the fact that he placed riffle cleats across the flow of the water, that is, at right angles to it, and that he terminated these riffles into what has been defined as advancing terminals; that is to say, each next riffle down the slope is longer than the previous one, bringing each succeeding tip nearer to the concentrates discharge end of the table; the whole set of advancing tips forms a diagonal on the surface of the table; is familar with the von Rittinger table; it has no riffles on it, and is inferior to the Wilfley table for want of the automatic action which Wilfley possesses; considers that the Wilfley table was a great advanced stride and initiated a new era in concentrators; Wilfley put his riffles on with the diagonal ending—the advancing terminals, as they are called, and from a structural

(Testimony of Robert H. Richards.)
point of view also tapered his riffles and so added to the strength of the machine in getting an [152] automatic control of the line of change of detention by such means; has seen a Wilfley table in operation under the conditions illustrated by Complainant's Exhibit No. 8 and, in his opinion, it illustrates a normal condition of operation; that part of the Wilfley table to the rearward of the line B B on the Wilfley table is not an absolutely essential part of the table, but acts as a guard in case of increased feed to take care of an overload; that part of the Wilfley table toward the concentrates discharge and from the line A A is not essential to the effective operation of the table; it adds a little to the cleanness of the concentration by the flow of water which comes down across it.

Q. What do you designate the portion of the Wilfley table that is occupied by the riffle cleats?

A. I like to call that the roughing plane, and by that I mean the top surface of all the riffles cleats.

Q. The tops of all the riffle cleats you treat as a distinct plane? A. As a distinct plane.

Q. And call that a roughing plane?

A. A roughing plane. That is where the roughing work is done, the removal of the large quantity of waste.

Q. And the portion at the ends of terminals of the riffles you call what?

A. I call that the diagonal of mechanical control of the line of change of detention.

(Testimony of Robert H. Richards.)

[153] Q. I refer now more particularly to the table surface.

A. The table surface I like to call the cleaning plane, which is the place where the last cleaning is done.

Q. Now, will you explain what you mean by change of detention?

A. If we consider a single riffle, and by that I mean the groove, on a Wilfley table anywhere along about the middle of the table, and we begin at the back end of that and follow it forward to see what is happening all along the line we shall see at the mechanism end it is simply carrying muddy water across the table. Pretty soon we reach the beginning of the quartz tailings, which are on the way to be separated from the pulp. We find here the coarsest quartz as the first grains we meet. Following along we find, if we should take a section down to the linoleum, a certain amount of heavy mineral in a layer beneath that quartz, that has been separated from the quartz, and as we go forward that layer of heavy mineral would increase in depth and the quartz would diminish in depth, at the same time the quartz grains diminish in size as we go forward. By and by when we got nearer to the tips of the riffle cleats when the groove was getting quite shallow we should find some of the largest grains of the heavy mineral were beginning to ride over into the next riffle below, but the bulk of all the concentrates would continually be pushed forward until it reached the tips. When it reached the tips of the riffle

(Testimony of Robert H. Richards.)

[154] cleats we should find that the ability of the table to detain the quartz was almost entirely expended that it can detain the heavy mineral and carry it out on to the cleaning plane, but it can to but a very slight extent, detain the quartz. This is what I mean by the change of detention. It is the change which takes place along that diagonal line of terminals where the quartz no longer can be detained upon the table except in minute quantities, and this is an illustration of my definition of the line of the change of detention.

Q. Will you define a riffle as you understand it, Doctor?

A. As I understand a riffle, it is a hollow, basin, pocket or cavity in a carrying surface used for carrying pulp, into which grains of pulp may settle. In regard to their ability to settle, the grains of higher specific gravity have greater ability to settle and stay than grains of lower specific gravity; in fact, a grain of higher specific gravity coming along to a riffle may displace a grain of lower specific gravity which is already bedded in the riffle, a grain of higher specific gravity may displace a grain of medium specific gravity, a grain of medium specific gravity when displaced may go down to the next riffle and displace a grain of lower specific gravity, and so it will go until the grains have found their places, those having greater stability being in the upper riffles and those having less stability being in the lower riffle.

[155] I am aware that in the literature and in fact in the proceedings of previous cases the term

(Testimony of Robert H. Richards.)

"riffle" has been applied to the cleat which is tacked on to the surface of the table. I argue that a cleat is not a riffle, and my line of argument to demonstrate that point is this: If we were to tack a dozen riffle cleats on the surface of the Wilfley table so close together that there was no space between them, they being tacked on parallel to the direction of throw, those dozen riffle cleats would only make one riffle; that one riffle would be the little basin or cavity above the upper or first one of the cleats. I argue, therefore, that if a dozen riffle cleats are not a dozen riffles, then one cleat is not a riffle. A single cleat may make a riffle in combination with the surface to which it is attached by making a little basin cavity above it into which grains can settle.

The witness stated further in relation to the tapering riffles of the Wilfley table that whether the taper shall be continuous or interrupted by one or more offsets is not very material to the operation or result; that it could be made to step off gradually or run in a continuous slope with substantially the same result.

(Plaintiff's Condensed Statement.)

ROBERT H. RICHARDS.

[156] Q. I will ask you what you regard as the departure, if any there is, in what is known as the Wilfley table as described in the patent, that is, the departure from the prior art as it was practiced in the dressing of ores.

A. The great advance made by Wilfley in his patent lay in the fact that he placed riffle cleats across

the flow of the water, that is, at right angles to it, and that he terminated these riffles into what has been defined as advancing terminals; that is to say, each next riffle down the slope is longer than the previous one, bringing each succeeding tip nearer to the concentrates discharge end of the table. The whole set of advancing tips forms a diagonal on the surface of the table.

Q. What was the effect mechanically of so adjusting the terminals of the riffles with reference, if it had any reference, to the arrangement of material as you have described the same to have occurred upon the smooth surface of the von Rittinger type of table?

A. I think I can best define the behavior of the von Rittinger table by describing an experiment done by me, and I will then show the difference between it and the Wilfley design. At a certain mill where I had been installing a classifier I expressed my wish to see whether these riffle cleats with diagonal terminations really did accomplish any result which could be said to constitute them an important improvement. **[157]** Out of six Wilfley tables that were creating the six spigot products of this classifier we chose the third, in which there was the greatest variation in size and rather the largest quantity of ore fed. I expressed my desire to my friend who was one of the owners and the manager of the mill, to try this experiment, and he said he would like to see the experiment tried also. We took off all of the riffle cleats from the Wilfley table except the

(Testimony of Robert H. Richards.)

upper six. We left those upper six on the table simply to prevent the rush of feed water from carrying the grains down in an improper way and to give all the grains a fair start across the table preparatory to the treatment upon the smooth surface table. This start proved to be well chosen and well made. We then observed the most extraordinary result, namely, the pulp ranged all the way from the upper corner of the concentrates discharge end, down the end and along the tailings discharge side until it reached a point directly down from the tip of the remaining riffle cleat directly down the slope. This product was beautifully graded from the clean concentrates which extended a considerable distance along these edges. We then came to the middlings which were graded from a little bit of quartz with much pyrites and gradually diminished the pyrites and increased the quartz until we came to the end where the pure quartz was in a line formed down below the end of the remaining riffle cleats. We all threw up our hats and said, "What a splendid thing!" We ran this table but a very short time before it became convincing to us all that we had not made an improvement at all, but that we had made a great step backward, and that the step backward was due to the fact [157¼] that we had no control of the line of change of detention. So long as the table was fed with perfect evenness as to the quality of pulp as to the size of pulp, as to composition of pulp, and as to quantity of pulp, and with perfect evenness as to the quantity

(Testimony of Robert H. Richards.)
of water in the feed pulp and the quantity of wash water, this table seemed to be successful. The instant a change came, the line of change of detention swung away from the position in which we had first found it and the concentrates ran into the tailings box or the tailings into the concentrates box. If the feed diminished the former took place; if it increased the latter. Either change would ruin the work of the table. To run such a table as that with any success at all it would have been necessary to stand by it, just as the driver of an automobile does who runs his automobile and guides it every instant of time—one would have to have control of the water, control of the feed, and control of the slope of the table constantly in order to maintain that line. That of course is impossible in a mill. The table must be automatic. We therefore threw it out and considered it a failure.

I ought to make one more remark in regard to the difference [157½] between that and the von Rittinger table. That was a true von Rittinger table in respect to the surface. It differed from the von Rittinger table only in the fact that we had greatly widened the table and shortened it in length, the two qualities which appear as two of the primary qualities in the Wilfley construction. This explained to me why it was that the von Rittinger table has to a certain extent held its own in foreign mills, namely, that it had always had its length in the direction of the flow of water and its width comparatively small so that the swing of the line of

(Testimony of Robert H. Richards.)

change of detention would be comparatively little. The great advantage obtained by widening the table and thereby widening the zone of separation into two or three minerals there was completely lost on the von Rittinger table. When we returned to the Wilfley construction and put back the riffle cleats with the terminals advancing along a diagonal line we restored the Wilfley table to having a very perfect control by mechanical means of this line of change of detention, and the table immediately became automatic, requiring an attendant to visit it from time to time, but practically automatic. [157¾] In view of this experiment and other conclusions which one must draw from it, it has seemed to me that while von Rittinger discovered the great principle of using two conflicting forces, namely, the jerking force to move the minerals across the table and the flow of water to bring the minerals down the table, thereby succeeding in getting this diagonal, he had so far failed in making a great advance in ore dressing that his table found but little use in this country.

Wilfley's invention increases the capacity very largely, and the efficiency of tables of von Rittinger type, and there became a demand for it in the concentrating mills. Its use spread all over the United States, and as well abroad.

Q. Now, I will ask you, Doctor, to take the model of the Wilfley table, Complainant's Exhibit No. 3 and the model of the Deister table, Complainant's Exhibit No. 6, and describe and compare first

(Testimony of Robert H. Richards.)
structurally and then functionally, the parts or elements of the two tables.

A. Following a riffle, and by that I mean groove, on the Wilfley table, I have already stated that the first thing we should come to would be the muddy water and slimes including fine particles of mineral that are flowing across the table, and this would occupy the space at the mechanism end of the riffle or groove. The next thing we should come to would be the coarser quartz, and those coarser grains of quartz would move towards the concentrates end until their ability to stay in the groove was [158] overcome by the carrying power of the downward flow of water. They would then fall over the cleat into the next groove and would move on there for a moment and then come to the limit that they were able to withstand against the carrying power of the water and again go down. The act would be repeated over and over until they reached the lower edge of the table where the tailings go off. Following along the groove we find the finer grains, and these grains maintain themselves in the particular groove under consideration, moving towards the concentrates end, until they have reached a point where they no longer can resist the carrying power of the water and they are carried over. The smaller grains will then zig-zag down the table towards the tailings discharge side, just as the larger ones did, but they will be in the zone along a diagonal in advance of where the coarser grains are. By and by we will find the concentrates at the bottom of the

(Testimony of Robert H. Richards.)

groove are beginning to show. They are increasing as we move forward, while the fine quartz is being lifted over, and when we get near the tips then some of the coarser grains of concentrates will reach a point where they cannot maintain themselves against the carrying power of the stream of water and they will be carried over and then moved along in the next groove until the groove shallows sufficiently for them to be carried over. The bulk of the concentrates, **[159]** however, will move out until they reach the tips at which points the quartz is nearly all removed from the concentrates and these concentrates will pass out into the zone and move along the surface of the table down a diagonal band that is a little above the diagonal line, of advancing terminals, until it reaches the discharge end.

In describing the Wilfley table I have described it as it is constructed and used and not with the steps in it as shown in this model Complainant's Exhibit No. 3.

Taking the groove on the Deister table, Complainant's Exhibit No. 6—and I take this from my experience in watching the Deister table as it has not been my privilege to work with the Deister table to anything like the degree that I have worked with the Wilfley, but from my experience with the Wilfley table and from watching the Deister on a number of occasions, I judge that the behavior of the pulp in the riffle of the Deister table is like this: The fine mud cannot get away from the rest of the pulp by

(Testimony of Robert H. Richards.)
falling directly down the slope as it does in the Wilfley table. It therefore flows down in a diagonal direction, being penned in by the bar or end on the mechanism end of the table, and the fine slime will therefore be mixed with the coarser quartz. The arrangement of the particles of the quartz will be much the same in this riffle groove upon the Deister table as it is in the case of the Wilfley. There will be this **[160]** difference—the Deister riffle cleats are of the same size in the upper section, three-sixteenths of an inch high; in the second, third, and fourth sections they are one-eighth of an inch high; in the early portions of the riffle as we move from the mechanism end towards the concentrates discharge end. When we get to within twenty-three and a half inches approximately of the concentrates discharge openings the riffle cleats are stepped from one-eighth of an inch high to one-sixteenth inches of the concentrates discharge openings they are stepped off from one-sixteenth of an inch high to one-thirty-second of an inch high; and when we are within two inches of the concentrates discharge openings, approximately, the alternate riffle cleats are ended. This will make a little change in the behavior of the pulp from its behavior on the Wilfley table. During its passage through the one-eighth inch high groove only the largest grains will go over unless there is a heaping up of grains (what we call on the streets a congestion of people) a congestion of grains takes place; then as a result of that congestion the quartz may be forced over from

(Testimony of Robert H. Richards.)

the particular riffle groove which we are discussing into the groove below. When we reach the stepping off then there will be a great increase at that point of grains that are pushed out and falling over and not able to withstand the downward flow of water, there will be great influx of grains into the groove below, and the groove below that, and so on down the table. This stepping-off **[161]** from one-eighth to one-sixteenth in height of riffle cleat takes place along a diagonal line and this diagonal line affects this change of detention that I have just mentioned; in fact, it is a diagonal line of terminals down the table and it effects a change of detention along that diagonal line of terminals. Following along the portion which is one-sixteenth of an inch high we see just the same thing happen that did in the earlier part of the one-eighth inch high riffles, after the great rush of grains had gone over the next cleat to the next below, and so on, then the grains will move along in that groove, only being removed when the congestion of grains forces them over, until the next step-off is reached where the riffle cleat steps down from one-sixteenth of an inch to one thirty-second of an inch there will be a second rush of grains over the top of the riffle cleat and down into the next riffle, and over that next riffle cleat and down into the next riffle, and so on down the diagonal, and this second row of stepping-off of the cleats from one-sixteenth to one thirty-second is a second set of advancing terminals analogous to the Wilfley advancing terminals, and it

(Testimony of Robert H. Richards.)
sheds a lot of quartz grains all the way down, just as the first one did, only probably not so much as the first one did because the quantity that can be held in a one-sixteenth inch deep riffle is much smaller than the quantity that can be held in a one-eighth inch deep riffle. Leaving this second diagonal we come to a **[162]** third diagonal which is made by the alternate tips of the riffle cleats which terminate at about two inches from the concentrates discharge openings, and this forms still a third line of change of detention, for on this line the grains which were maintained in the riffle just above these shortened riffle cleats lose their support of a riffle cleat entirely when they pass beyond the end, just as happens on the tip of the riffle cleat on the Wilfley table. When the concentrates reach that point they are in two streams. There is a stream of concentrates which is the upper groove above that terminating riffle cleat, and a concentrates stream which is in the lower groove just below that terminating riffle cleat and these two mix at the end of the terminating riffle cleat and the wash-water which comes in there washes off the last of the quartz. It can be adjusted to get more or less water at this point, the idea being to wash off the last of the quartz and then let the concentrates pass down and be guided into the concentrates opening by the lower riffle cleat of the pair, which goes directly to the guard wall of the concentrates discharge opening. Its behavior at this point is just the same to my mind as the behavior at the tip

(Testimony of Robert H. Richards.)

of the riffle cleat of the Wilfley table where the concentrates pass out from the detaining power of the riffle cleat on to the smooth area and meet the downflowing side rush of water; so on the Deister table the concentrates pass out from these two riffles in this little open space two inches **[163]** long and meet there a stream of water concentrated upon them, washing across them, to wash out the last of the quartz, and then they go down here into the concentrates discharge opening. The only difference between the two tables is the method by which these concentrates grains are saved. On the Wilfley table they form a band and travel to the concentrates end of the table and then go over the end and are caught in a box. On the Deister table they are propelled that two inches of clear space, go down through the openings and are caught in a box at that place.

Going back to the difference between the tapered riffle cleat of the Wilfley table and the stepped riffle cleat of the Deister table, I can say that this is simply a difference in degree rather than a difference in kind; that whereas on the Wilfley table this shedding of grains from one riffle over into the next when the detaining power of the riffle upon the grains is overcome by the force of the wash water is gradual all the way along, in the Deister table it is by spurts and jumps. There will be a decided magnification of it along that rear edge where the larger grains form. Then as we move forward to the first step it will be diminished until we reach the first step, then

it will be increased at that point for a short space, and then there will be an increased tendency to shed the quartz down the slope of the table. It will be diminished again as it reaches [164] the second step and after it has passed the second step it will be increased for a moment again and then, it will be diminished to a certain extent until it reaches the tips of the alternate riffles, and then the final ending of the detention will be at the ends of those alternate riffles except as the clean concentrates are detained by the intermediate riffles between the cut-off riffle cleats.

The Deister table, illustrated by the drawing, Complainant's Exhibit 5, and Complainant's Model Exhibit 6, answers to the description given in the claims of the Wilfley patent involved in the suit; Wilfley accomplished a stride in the art by the means disclosed in this patent, and that his invention constituted an advanced stride in the art of ore dressing is evidenced by the records of the United States Patent Office; the inventions prior to the Wilfley patent do not disclose the combination of roughing plane, cleaning plane and diagonal of mechanical control of the line of change of detention, while the patents subsequent to the Wilfley in nearly every case do exhibit these features; witness recites and describes some fifty patents in the art subsequent to the Wilfley showing and recognizing the feature of invention disclosed in the Wilfley patent.

On cross-examination says the result of Wilfley's discovery [165] divides the table into three parts

(Testimony of Robert H. Richards.)

—roughing plane, cleaning plane and diagonal of mechanical control of change of detention; this is the great advance that Wilfley has made, the advance that has made his table the forerunner of a new type of table; the end or terminals of the riffle cleats toward the concentrates discharge end is the essential effective portion in the operation of the Wilfley table; the main effective portion of separation occurs under these conditions substantially in the space AA–BB; that surface A, described in figure 3, in Wilfley patent drawings, in addition to serving as a cleaning surface as the material passes from the riffle tips outward, also serves to carry the wash water downward across the table toward the riffle tips; that the essential effective portion of the riffle cleats in the operation of the Wilfley table is in the end or termini, because it is the point at which the support of the gangue grains is removed and the flow of the wash water from that point on has sufficient force to prevent nearly the whole of the quartz or gangue from being detained on the surface of the table; this is really the most important point there is in the separation by the Wilfley table; referring to space on exhibit 8, between the line BB and the mechanism end of the table, witness states that when the table is fed normally with an even feed and the feed is free from slime or fine mud, that portion of the table simply **[166]** carries off the excess of feed water and some of the excess of wash water; it has no other significance; those two uses can hardly be said to be important enough to make that large area an essen-

(Testimony of Robert H. Richards.)
tial feature of the table; the feature which this portion of the table does utilize is that if the table is fed with uneven feed it is there to handle the overload; the second feature: if the table is fed a mixture of fine slime with the ordinary pulp it gives an opportunity to separate the fine slime; neither of those features is essential to the main feature of separation; you could dispense with it; the purpose of the part from the line AA is to convey the concentrates after they have emerged from the ends of the riffles to the concentrates end; also to do a little final cleaning, and it carries and directs the film of water from the wash-water box.

Explaining the feature of the step-off arrangement of the Deister riffles, witness states that as the grains are passing along the grooves toward the concentrates end of the table, they suddenly find themselves released from the penning up action of the higher riffle cleat and they are freer to pass over the lower riffle cleat, which is towards the concentrates end of the line AA, and the top grains of the layer do so pass over. There is, therefore, a change along this line AA, of grains of gangue being more penned upon the mechanism side of the line than to the condition of greater freedom on the [167] concentrates side of the line AA; in practical operation the actual physical termination of the cleats where they are tapered or lowered by steps may not in all cases be the operative or functional termination of the riffle cleats in the practice of concentration, if the obstruction is low or slight enough, rela-

(Testimony of Robert H. Richards.)

tive to the more elevated part of the riffle cleats; the lowest portion of the riffle cleat in physical construction may act relatively as a smooth or unriffled surface in the separation; in the Deister table, under an adjustment which would bring the line of final separation of the waste from the values towards the concentrates end of the table from the line BB, the final cleaning operation would occur along the terminals of the shorter riffle cleats on the line DD, or somewhere in the space between the line BB and the line DD, assuming an adjustment which would bring the line of final separation in the diagonal zone between the lines AA and BB, and in each case the concentrates were sufficient to fill the channels between the riffle cleats in the diagonal zone between the lines BB and DD, the area between BB and the end at the head motion of the table would be what I call the roughing plane, where the tailings are nearly all eliminated, and the diagonal zone between BB and DD acts as the cleaning plane, in which the concentrates are being conveyed forward to the concentrates discharge end; with the exception of a slight elimination of [168] quartz between the lines BB and DD, those channels would be acting merely as conveyors to the concentrates, and that surface would be a relatively smooth surface, sufficiently smooth to expose the waste, while retaining and guiding the values to the receptacles provided for them; whatever quantity of waste would pass out there would be exposed to the side wash of the water, just the same as it would be exposed by the terminals of

(Testimony of Robert H. Richards.)
the Wilfley riffles; when the word "smooth" or "unriffled" is used in the art it would have the meaning "smooth enough" or "unriffled enough" for the performance of the function which it is calculated to perform, in speaking of the roughing surface as compared with the cleaning surface of the table; it is not necessary on either Wilfley or Deister table, in practical operation, to perform the functions of advancing terminals of riffles terminating on a smooth surface that the smooth surface should have any definite dimension or form, only sufficiently smooth and large to accomplish the function described; the Deister table is a structure provided with a plane of unriffled portion of the suitable area located at the extremities of the riffles for the purpose specified in the Wilfley patent; removal of the upper concentrates corner and lower mechanism corner by which opportunity for the elimination of slime from the gangue and removal of excess feed and wash-water is provided, would not interfere with the performance of [169] the function of the riffles terminating diagonally upon a relatively smooth surface; the broad direction of the diagonal of termination of riffles on the Wilfley table is not a fixed feature—it may vary considerably and still have the advantage of advancing terminals; likewise the angle of termination of riffle tips on the Deister table might vary from the Wilfley angle, and this would not materially affect the embodiment of the Wilfley invention of advancing terminals of riffles terminating upon a relatively smooth surface; the step-off

(Testimony of Robert H. Richards.)

points on the riffles on Complainant's Exhibit No. 3, with same adjustments as to location of line of final separation, would operate identically as same construction on Deister table; it is not material that the mineral be conveyed from the smooth surface of the Wilfley table after separation is complete; it could be withdrawn by other means; the concentrates as they emerge from the riffles on the Deister table are subjected to continual washing on the unriffled or relatively plain surface, the operation being the same on both tables, but the concentrates being removed by openings in the Deister table and not conveyed to the end, as in the Wilfley table.

[Testimony of Clarence J. Glassbrook, for Plaintiff ~~Defendant~~].

(Defendant's Condensed Statement.)

CLARENCE J. GLASSBROOK

States that he has been a special representative of the [170] Mine and Smelter Supply Company in demonstrating the concentrating devices handled by that company since October, 1906, is acquainted with the Wilfley and Deister tables; has seen Deister tables in the form represented by Complainant's Exhibits No. 5 and No. 6, at work; prior to the advent of the Wilfley table the machines most in use were the Frue Vanner and the Gilpin county bumping table; remembers the Wilfley table since 1897; it was constructed with tapering riffles as now; it went into wide use immediately; the elements which contributed to the success of the Wilfley table were the re-

(Testimony of Clarence J. Glassbrook.)

ciprocating mechanism and the riffled surface; the adoption of riffles placed in longitudinal direction to the line of motion on a horizontal plane, the terminals of which riffles were on a diagonal line advancing downward and forward from the concentrates end of the feed box at the mechanism end of the table to the lower corner of the concentrates discharge end of the table—it was this construction which made the table so successful; it is not possible at all times and under all conditions to feed to a concentrating table a continuous and uniform supply of material or water; if this could be done it would be possible to extend the riffles the whole length of the table and yet secure a uniform product of concentrates; this being impracticable it was necessary to seek an automatic adjustment of material and treatment, and the diagonal termination of the riffles was most effective for that [171] purpose; in the construction of the Deister table the headboard along the mechanism side of the table is at a more acute angle than the corresponding headboard of the table shown in the Wilfley model; this causes the pulp to flow on a more restricted area, the effect of which will be to limit the surface over which the water and fine sands and mineral in suspension will flow.

(Plaintiff's Condensed Statement.)

CLARENCE I. GLASSBROOK.

The removal of upper concentrates corner and substitution of a wash-board at the extremities of the riffles and the removal of lower corner of mechanism end of the Wilfley table would not interfere, or only

(Testimony of Clarence J. Glassbrook.)

to a very limited extent in degree, rather than function, with the efficiency and capacity and the effectiveness of the operative functions of the combination of advancing terminals with smooth surface of the Wilfley table; the placing of riffles upon the surface of the table in a line parallel with the direction of the motion imparted to a greater or less extent is instrumental in effecting and controlling the resultant of two forces of end movement and side inclination, to a certain extent constitute effective means of controlling the location and direction of the diagonal lines of arrangement of material on the concentrating surface; that Wilfley's invention of advancing the terminals of his riffles along a diagonal line on the table surface not only takes [172] advantage of the natural line that would be produced by the two forces, but prolongs it and carries it out to a greater extent than would otherwise occur, making it possible to derive from its action a greater benefit and cleaner and better separation than could be made without it; the Deister table has not dispensed with any of the essential features of the Wilfley invention, but has embodied all of them; as applied to the practice of ore dressing, has never seen an absolutely smooth surface; so far as the mere act or function of riffling is concerned, a riffle need have no particular shape; the line of demarcation between a rough or riffled surface, functionally speaking, and a smooth surface, sufficiently smooth to perform the function desired, cannot always be accurately determined from physical construction—one may merge into the

(Testimony of Clarence J. Glassbrook.)

other; on Wilfley table what is called smooth or unriffled surface has to be sufficiently rough to retard the downward passage of the relatively heavier particles of value to be saved; in the practical operation of the machine it is immaterial whether that surface is covered with a roughness such as represented by linoleum, or whether it is a smoother surface made rough by slight scratches or slight elevations or depressions; in actual practice the condition would be the same; the proposition as to what constitutes smooth or dressing surface and what constitutes a riffled or roughing surface is [173] a relative proposition always, and the exact point at which the operation of roughing terminates and the final cleaning takes place is to some extent independent of physical construction; difference in operation between Deister and Wilfley tables by reason of restricted area of surface of former is not in actual function performed, but only in degree.

[Testimony of Arthur R. Wilfley, for ~~Defendant~~ Plaintiff].

(Defendant's Condensed Statement.)

ARTHUR R. WILFLEY

States that he is one of the directors of the Mine & Smelter Supply Company, consulting engineer for that company, and a stockholder in the company; is the patentee of letters patent No. 590,675; has been concentrating ores and experimenting in concentrators for thirty-one years; his first table of the transversely inclined type having a reciprocating mechanism was a small experimental table in his

(Testimony of Arthur R. Wilfley.)

private testing plant in the spring of 1895; this table had one tapering riffle on the lower side; within a month or two he built a table about 4 feet by 8 with a transverse inclination and surface of rubber, and placed it on a bumping table mechanism, using a hammer for a bump; and on this table he placed riffle cleats of different length—as many as three anyway, the lower one extending from end to end of the table, the one on the upper side from the mechanism end about 4 feet and the middle one between these two, the three ending [174] on a diagonal line; has kept closely posted on what was being done in the mining regions of the Rocky Mountains; used several different surfaces upon his table—plate glass, linoleum, wood, sheet copper, and sheet steel; the glass was too smooth or slick; used many forms of riffle cleats; made experiments constantly for three months to develop the best form of riffle cleat; the result of the combination of riffled and unriffled surface was to make a difference of paying or not paying on the ore; the table immediately became very popular; something like twelve thousand are in use; the standard table first sold had a deck 16 feet long by 5½ wide, covered with linoleum, King-Darragh head motion; transverse inclination with riffles terminating on a diagonal line, the lower riffle extending from end to end, commencing at a given thickness at the mechanism end and tapering gradually to a feather edge at the concentrates end, feed box at the upper mechanism corner and wash-water box extending from the feed box to concentrates end of

(Testimony of Arthur R. Wilfley.)

table; has seen the Deister table; on it the feed box is parallel to the riffle cleats while the wash-water box is parallel to the terminals of the riffle cleats; there is a smooth surface at the end of the riffle cleats for discharging the wash-water; there are holes at the terminals of half of the riffle cleats and some little distance from the terminals of the other half of the riffle cleats; **[175]** consider tapering form of riffle to be the best for a standard table to be applied to different materials; that was his opinion when he made his application.

(Plaintiff's Condensed Statement.)

ARTHUR H. WILFLEY

Describes his experiments on smooth-top table, Rittinger type, and the result of his addition of riffles thereto and the manner of his patent-described invention, placing the riffles where the same were most effective, and removing riffle protection where their absence was desirable to attain the best efficiency and capacity of the apparatus; that his experiments were to find some way of passing gradually from the catching qualities of the corrugated or channeled surface to a smoother surface, and finally developed the diagonal termination of riffles at the point considered, the roughing plane with the clean-ore plane, bringing it to a cleaning point gradually; after some experiments with a belt table he resorted to the transverse inclination table, and running such a table with a smooth surface developed the natural diagonal line due to the wash-water and the mechanism, the co-efficient of the two; then adopted the

(Testimony of Arthur R. Wilfley.)

roughing or protecting surface to one side of this natural diagonal line and allowed the other to be exposed, giving a constantly stratifying and catching quality to one side and a cleaning effect on the other side of this line of [176] separation, and also giving at all times the opportunity for a particle to retreat to the stratifying plane, where it might be retained; discovered value of the protection and support of a series of riffles adjusted with reference to this diagonal line in the stratification and arrangement of the pulps for submission to the cross-flow of the water progressively as the protection of the riffles was gradually withdrawn along approximately this natural diagonal line of separation, giving the surface a stratifying effect where particles might be dropped down into the channels and become entirely protected from the wash of the water, and stratifying in this form and be carried forward towards the cleaning zone and to approach and pass on to this cleaning zone without being disturbed, while lighter particles resting on top of the strata of mineral would gradually become exposed as the riffles terminated, and would be washed back the mineral remaining on the cleaning surface without having been disturbed; any particles washed off of the top being washed down into the channels, with greater holding capacity below, were carried forward again, with another opportunity to be saved; this was repeated down the diagonal line, there being a gradual passing from roughing zone to cleaning zone, not merely treating a portion of the ore on the riffled or roughing

(Testimony of Arthur R. Wilfley.)

surface and then on the smooth surface [177] but a combination, one passing into the other insensibly; this result was accomplished by the advancing terminals of riffles without regard to any particular form or shape of riffle cleats; made experiments with the disposition of riffle cleats, so to vary the direction of the diagonal terminations thereof, and found that by such changes the riffles controlled the diagonal line of separation of the material within a certain range; in describing experiments with the smooth-top table of the Rittinger type, states that the line of separation is very hard to maintain on any particular point on the table, making it hard to control the concentrates and the tailings, so that you can put a divider on the table and save concentrates and reject tailings; this line will vary materially in case of variations in the quantity of mineral in the pulp, variations of water and numerous other variations that necessarily occur in a mill; the line will move so easily it is almost impossible to operate a table of this type in a mill in a practical way; even though you were to stand at the controlling lever every moment of time and make a perfect cut of a line of separation the work is not good; the riffled surface has at least double the capacity with anything like the same efficiency under the same conditions.

Q. I will now ask you to describe the operation of the Wilfley table, and from your knowledge of the operation of this [178] type of table under proper adjustment, to compare with it the operation of the Deister table as you understood it to be.

(Testimony of Arthur R. Wilfley.)

A. When the pulp is fed upon the Wilfley table from the feed box the heavy pulp spreads down across the deck in a broad diagonal band. The water in the pulp, even when the pulp is not sized and containing considerable slime, which we often call slime water, passes practically straight across the table and over the side, a certain amount of material settling out of this slime water into the channels between the riffle cleats. The back boundary of the heavy sand product will form in a diagonal line represented by the line BB on Complainant's Exhibit 8. The portion of the table between the line BB and the mechanism end represents the portion of the table where the slime water is passing over. The other boundary of the heavy sand is represented by the line AA on Complainant's Exhibit 8. The part of the table from the line AA on Complainant's Exhibit 8 to the mechanism end I term the roughing surface, and from the line AA to the concentrates end I consider the clean ore plane. A small band, say something like six inches wide, extending from line AA back towards the mechanism end I term the zone of final separation, and the line AA the line of final separation. Over the band of pulp represented by AA and BB is the constant film of water carrying pulp passing along diagonally over this surface and down over the side of the table. The [179] mineral is constantly being extracted from this film and dropping into the channels. In the bottom of the channels is a layer of strata of mineral forming. Along the line BB this strata will be very thin. As we

(Testimony of Arthur R. Wilfley.)

progress towards the line of final separation AA this bed of mineral will gradually increase in thickness due to the mineral constantly dropping in the channels. As the material moves forward this strata of mineral is on the bottom of the channels, on this gangue, as the mineral increases the gangue is raised to the top of the channels, where it is constantly being washed off, so we have a strata of mineral in the channels with a strata of gangue on the mineral moving towards the zone of separation. As it approaches the zone of final separation the gangue has washed off, so that when we reach that point the mineral begins to show through. We are then dealing with a certain amount of doubtful material on top of the mineral, in other words particles that are questionable whether to be saved or to be rejected. This is the part I call the zone of final separation. Taking a channel near the upper side of the table we find this action going on, so that this doubtful material as it passes through the zone of separation is forced off of the top of the mineral, the mineral lying in a well-defined strata on the bottom. In forcing off this heavy gangue there will be some particles of mineral forced off with it. As it passes down to the next channel it is caught again, and again passes through [180] the zone of separation and is washed off into the next channel below. This continues all down along the zone of separation, constantly bringing these doubtful particles up, giving them another chance, until we reach the lower concentrates corner of the table where we must make the final separation.

(Testimony of Arthur R. Wilfley.)

At this lower corner there is a riffle cleat extending the entire distance to the end of the table, so that at all times any particle that is rejected must be rejected over a channel which has a stratifying and guiding effect to the particle. A well-defined band of mineral passes out of the channels on the bed of the table and forms in a broad band approximately parallel to the line of the riffle tips, and passes over the end of the table. This band of mineral is represented by the material in advance of the line AA on Complainant's Exhibit No. 8.

On a Deister table, constructed on the principles and of the construction of Complainant's Exhibit Model No. 6 I would say the action would be about like this: When pulp is fed upon the table, the slime water will take a course along the end board of the table diagonally down to the lower side of the table. This band of slime water would not be very wide. Just in advance of this slime water would be the heavy sands. This would pass diagonally down across the table. If the table is being fed heavily this heavy sand may extend almost to the end board, and the slime water would pass over the top of the heavy sand. With [181] a light feed this band of slime water might be of considerable width. The band of sands will form in a diagonal line as they do on the Wilfley table, the mineral settling into the channels between the riffle cleats, and there will constantly be a film of water and pulp passing over this band of heavy material along a diagonal line. As this material would move forward under the action of the

(Testimony of Arthur R. Wilfley.)
mechanism, the mineral would be stratifying in the bottom of the channels between the riffle cleats, and on top of this would be gangue. As it is moved forward the mineral would increase in quantity, the strata would become thicker, and in such case the gangue would naturally be pared off, due to its being forced above the tops of the riffle cleats, and in this manner it will proceed forward, gradually paring off the gangue, and gradually increasing the bed of mineral, due to the mineral dropping out of the pulp passing over. As it reaches the first little jog in the height of the riffle cleats there would be a little additional paring out at this point, in fact considerable more paring takes place along that diagonal line of the change in the height of the riffle cleats. If the mineral contents were very great this line could well be used as a line of final separation, the difference in height of the riffle cleats being sufficient to make a retaining surface and an exposing surface on either side of the line. In most cases this decrease in height of the riffles would not be sufficient to complete the work, [182] and it would move forward; but the gangue being very much diminished and rapidly diminished along that line as it proceeded forward, it would come to the next step in height of the riffle cleat. From this point to the end of the riffle cleats I would consider the zone of final action. In most cases though because of this jog in the height of the riffle cleats the table might well be used on a great many ores containing a rather large amount of mineral by making a line of final separation along that

(Testimony of Arthur R. Wilfley.)

point and using the surface with the very small low cleats as an exposing surface or smooth surface. But for careful work and for I presume the majority of ore the better point for the final line of separation would be where each alternate riffle cleats end and from that point back to the first step, as I have said, I consider the zone of final separation.

As the mineral passes into this zone of final separation, we have what we call the doubtful material on top of the mineral again, just as I have described in the Wilfley table. At the upper end of the zone of separation, as we wash this doubtful material off, we no doubt wash off material or particles of mineral. They are washed down into the channel below, which has a greater holding capacity than the channel it left, and this repeated action goes on along down this zone of separation **[183]** exactly as it would in the Wilfley table. As we pass through the zone of separation to the end of the alternate riffle cleats, here the contents of one of the channels passes on to the smooth linoleum surface, the wash water giving it the final dressing, removing the last gangue that is to be removed. The one little riffle cleat extending to the opening in the table would retain the mineral, but being so low would retain no gangue, merely acting as a support to the mineral, as do the ends of the riffle cleats in the Wilfley table, and also just as does the lower riffle cleat in the Wilfley table, which acts as a support for the mineral passing out from the end of the table at the lower concentrates corner. The Wilfley table is

provided with a roughing surface sufficient to catch, stratify, and direct all the concentrates and enough of the tailings to secure protection to the concentrates up to the line of final separation. It is provided with a surface there which will hold the concentrates and retain them, but will expose all the gangue to the wash water and reject the last particle to be rejected.

The Deister table is provided with a roughing surface, with riffle cleats and channels sufficient to catch, hold, stratify, and direct all the mineral and enough of the gangue to protect the mineral up to the line of final separation. There it is provided with a surface capable of holding the mineral and yet exposing all the gangue to the arbitrary current of wash [184] water. At all times on the Wilfley table there is a riffle cleat over which the gangue must pass before reaching the tailings side of the table. The Deister table is constructed so that at all times any particle of gangue must pass over a riffle cleat before reaching the tailings side of the table. As the strata of mineral on the bed of the Wilfley table moves forward under the mechanism, the gangue is gradually pared off, so that when it reaches the line of final separation, there is no obstruction sufficient on the bed of the table to reach up through the strata of mineral and interfere with the washing off of the last gangue. On the Deister table the channels are sufficient to hold all the mineral and some of the gangue up to this line of final separation, and as the strata of mineral on the bed

(Testimony of Arthur R. Wilfley.)

of the table reaches the line of final separation, the table is provided with a surface that will hold the mineral, with no obstruction that will reach up through the strata or mineral to prevent the washing of the gangue. This line of passing from the protecting surface to the exposing surface of the Wilfley table is along a diagonal line extending from practically the outer end of the feed box to the lower concentrates corner. The line changing from the holding to the exposing part of the Deister table is along a line practically from the end of the feed box to a point on the table near the lower concentrates end. Along this zone of final separation on the Wilfley table is the very [185] important part of the table. It is very much like taking a pan of pulp, panning it repeatedly, and panning off most of the gangue, and then panning it into another vessel, catching the middlings, and panning down to clean concentrates, removing the clean concentrates from the pan, and taking the middlings and repanning them, each time repanning them from a pan where it can be repanned again. This takes place on the Wilfley table very much in this way. The rough sands are sloughed off rapidly on the roughing surface, but as they come to the zone of final separation, we have a material in such a condition that we would call it doubtful. It is almost of the specific gravity of the concentrates and of almost the resistance, and yet not of sufficient value to be saved. Some particles have almost the same specific gravity and resistance as the gangue,

(Testimony of Arthur R. Wilfley.)

and yet should be saved. So that here is where we are doing the most important part of the work, just as you would do in a pan. After panning time after time, in the last panning you would be very careful to not reject any mineral and yet not to leave any more gangue in your concentrates than possible. This is so with the table. At the upper side in the channel between the upper riffle cleats there is a very similar panning effect going on, and what is being panned represents a small amount of middlings. It is panned into a channel, where it is repanned, the heavy gangue having been sloughed off by the **[186]** rough part of the table, and the great bulk of the concentrates having passed out on to the smooth surface of the table, where the work is completed. So that we have this repeated panning all the way down the point of the riffle cleats. By this I do not mean that the entire amount of material is being disrupted and repanned, but merely the small part that is sifting along over the top of the concentrates. This material is being constantly acted upon, passing along down this diagonal line, striking in the riffle below and coming up for repeated trials. In the Wilfley table, after the line of final separation is reached, there is a smooth surface which merely acts to convey the material to the end of the table and into the concentrates box and is there merely for convenience of construction. In the Deister table, after the line of final separation is reached, there are holds along the bed of the table where the concentrates would

(Testimony of Arthur R. Wilfley.)

be taken off instead of passing out on the smooth surface. These holes have nothing whatever to do with the concentration of the ore, but are merely a means of taking care of it after the work has been completed. On the Wilfley table, after the line of final separation is reached, namely, the tips of the riffle cleats, the process of concentration is completed and from there on it is merely conveyed. The Wilfley table embodies every principle of concentration embodied in the Deister table, and the Deister table embodies every principle of concentration in the Wilfley table.

[187] In the use of concentrating surface where corrugated rubber with grooves extending longitudinally was substituted for linoleum surface, the corrugations merely retained the mineral and conveyed it to the end of the table, but lines of separation took place along the riffle tips, the same as in the Wilfley table. By substituting proper sections in the combination model of the Wilfley and Deister tables the Wilfley table is represented, except there are little jogs in the heights of the riffles instead of a gradual taper; that in ninety per cent of the concentration of the country the Wilfley table might as well cut off the near ends of the riffle tips; that all the surface that is necessary is only so much as will be necessary to finally wash the material as it passes from the riffle tips; that he does not regard the entire surface represented by section Exhibit No. 7 A. W., of the combination model No. 7, as an essential part of his invention of combining a riffled

(Testimony of Arthur R. Wilfley.)
with a relatively smooth surface, and, referring to Exhibit No. 8, says it shows very distinctively the ban of heavy material represented by lines AA and BB; the portion back of that towards the mechanism end is merely carrying muddw water, in case the ore is unsized and very small material is settled out of this water and carried forward; in case pulp is being sized, which it often is, there would be no pulp to speak of there—it would be merely water passing this surface; in case that surface was removed and [188] sized pulp was being used, without slime water, it would make no difference whatever; in case it was removed where mixed pulp was being worked, the slime water would be deflected along down and over the sand and a certain amount of the mineral would be settled out into the sand, and it would make very little difference; have cut tables off in this way and found very little difference, whether the water is allowed, to flow straight across the table or whether it is carried along down the band with the heavy sand; the difference so slight that have never been able to detect any difference under normal conditions and normal load; in case of overload there is still very little difference; it may pile up against the end board and gradually work out; the Deister table in suit is so constructed as to respond to the claims of the Wilfley patent involved in suit; the distinction between riffle cleats being physicially and nominally riffles and functionally not riffles is a matter of relative terms and depends upon the work being done, the adjustments, etc.

[Testimony of John Michael Callow, for ~~De~~ Plaintiff.]

(Defendant's Condensed Statement.)

JOHN MICHAEL CALLOW

States that for nearly twenty years he has been engaged in designing and constructing mining and milling plants, especially concentrating plants and is president of the General Engineering Company of Salt Lake City, Utah, which has a metallurgical [189] laboratory for performing concentrating and ore dressing tests, and is equipped with Wilfley tables; has been familiar with the Wilfley table since 1897 or 1898; and states that it has covered the entire field of ore dressing and it is the predominating type of machine for the treatment of medium sized material; that the Wilfley table is one of the most important inventions made in the mining industry; that the von Rittinger table might be called the prototype of table having a motion in one direction and transverse inclination and using a film of water flowing down the slope of the incline; that Wilfley's invention consisted in placing riffle cleats on one portion of the concentrating surface and terminating them along a diagonal line, dividing the table into a roughing plane and a smooth plane; that the effect of the riffle cleats on the Wilfley table is to restrain or hold back the material and to guide it in the line of motion; that the effect of the diagonal arrangement of riffle terminals is the controlling or governing effect upon the line of separation between the gangue and the mineral pro-

(Testimony of John Michael Callow.)
ducts and within certain limits automatically controlling this line of separation on the table; that this automatic control has contributed most to the use of the machine in practice; that Complainant's Exhibit No. 8 photograph represents the Wilfley table in operation with a normal feed and under normal conditions; that the elimination of gangue and waste from values [190] is practically complete on line AA of the photograph and the band or zone of quartz or waste lie between the lines AA and BB of the photograph; that Complainant's Exhibit No. 3 model represents the Wilfley construction with the exception of the steps in the riffle cleats.

He states further that in November or December, 1909, he saw a Deister No. 2 table at the testing plant of the Miami Copper Company at Globe, Arizona, and it was of the same construction as the Complainant's Exhibit Drawing No. 5 and Exhibit No. 6 model; that the large spread of unriffled surface at the concentrates end of the Wilfley table is not absolutely essential to the successful operation of that machine; that he made an experiment on a Wilfley table five or six years before by cutting four slots in the deck along the diagonal line and discharged the concentrates through the slots into a launder beneath the table without affecting the operation or results of the machine in any way; that the riffles and smooth surface at the terminals thereof of the Deister table which he saw at the testing plant of the Miami Copper Company

(Testimony of John Michael Callow.)

were performing the same function in substantially the same way as it is performed in the normal adjustment of the Wilfley table in operation; that the line of demarcation between the mineral and gangue on the Deister table at the Miami Copper Co. was carried somewhere between the lines DD and BB of Complainant's [191] Exhibit No. 5 drawing and the zone of final separation was carried on the thin riffle cleats.

Comparing the operation of the Wilfley table and the Deister table the witnesses stated that, assuming the two machines to be fed with the same amount of feed, the material will spread over the tables and fill up the spaces between the riffle cleats; the tables will be adjusted transversely so that the material will have a downward course; as the head motion propels the material toward the concentrates end the mineral contents will find their way between the riffle cleats, the mineral on the bottom and the quartz or gangue above it; as the body of the material progresses more and more of the quartz will be sheered off until as we get near the riffle tips the mineral will begin to appear and the quartz will disappear; like adjustments might be established in the Deister table; the wash water would come across the broad expanse of the unriffled surface of the Wilfley table, and in the case of the Deister table it would come across the incline which lies immediately underneath the wash water box.

He further states that Complainant's Exhibits 7 A–W and 7 C–W are not essential to the operation

(Testimony of John Michael Callow.)

of the Wilfley table; that the riffle cleats of the Wilfley table conform to a natural diagonal line that will be formed by the material on the table when subjected to the various forces at play and keep the band of mineral intact and guide it towards the concentrates discharge, [192] which function is one of the chief functions of the diagonal arrangement of riffle terminals; that on the Deister table there would be a band of minerals for each alternate short riffle—between each short riffle cleat and the concentrates holes and that the only smooth or unriffled portion of the Deister table as illustrated on Complainant's Exhibits 5, 6, and 7 is the smooth space adjacent the end of each alternate short riffle, and that if the channels between the line BB and the concentrates discharge openings of Complainant's Exhibit No. 6 are filled with mineral in the zone between lines B B and D D there would be more or less of a passage of the mineral with gangue along that surface on the top of the mineral passing down in a diagonal line practically parallel with the riffle tips.

(Plaintiff's Condensed Statement.)

JOHN MICHAEL CALLOW.

All concentrating tables that have come out in competition with and to do the work of the Wilfley table have in witness' mind been patterned after the Wilfley invention; an embodiment of the Wilfley idea appears to be essential to efficiency and capacity; with the transformation from the Wilfley construction to the Deister, as illustrated by Complain-

(Testimony of John Michael Callow.)

ant's Combination Model, Exhibit No. 7, the Deister construction embodies and includes the effective operative surface of the Wilfley concentrator construction practically in its entirety; that the [193] Deister construction represented by the exhibits corresponds to the claims of the patent in suit.

[Testimony of Vernon E. Hodges, for ~~Defendant~~ Plaintiff.]

(Defendant's Condensed Statement.)

VERNON E. HODGES

States that he has been engaged in his profession as a patent expert and solicitor since January, 1886; has given much time to the subject of ore dressing; is familiar with the Wilfley patent in suit, and with its practical operation; the Wilfley table presents two main surfaces or planes, one of which is the riffled or roughing plane, and the other the unriffled or cleaning plane; the reference in the patent to riffles of unequal length has no significance beyond an intention to describe the arrangement of terminals along a diagonal line; the expression "triangular portion" as referred to the part marked A in Fig. 3 was evidently one of many forms which that portion of the table might have taken; passing to the Deister table, it is rhomboidal in shape and composed of an area occupied by the essential working elements of the Wilfley table; the inclined surface of the washboard of the Deister table is simply a part of the so-called smooth, plain, or unriffled part of the Wilfley table reduced to a minimum; the space occupied by the 1/32nd inch thick riffles pre-

(Testimony of Vernon E. Hodges.)

sents a relatively smooth, plain, and unriffled surface which would be still smoother when in operation owing to the fact that the shallow terminals fill up to their full capacity with [194] concentrates; no concentration takes place in the space occupied by those shallow riffles; the work of concentration is complete when the material reaches the line BB; does not find any limitation in claims 1, 2, or 7 to the form and dimensions of the so-called plain, smooth and unriffled portion; and while the words "varying in length" and "unequal in length" as applied to the riffles are employed in the claims, they were evidently directed to the actively operative ends of the riffles more than to the entire riffle; considers that those portions of the riffles on the Deister table that lie between BB and CC on Complainant's Exhibit No. 5 drawing perform no useful function as riffles and may therefore be disregarded and the space across which they pass treated for the purpose of considering the application of claim 1 of the Wilfley patent as though they were not there.

(Plaintiff's Condensed Statement.)

VERNON E. HODGES.

Speaking of the invention of the Wilfley patent, witness states that the table comprises a deck divided into two areas or planes, to take advantage of the natural arrangement of the constituents of the ore pulp in diagonal bands, in the order of their specific gravities, as a result of the two forces to which the same are subjected on the surface of the table,

(Testimony of Vernon E. Hodges.)

namely: end-wise motion imparted to the deck and transverse [195] flow of wash water across the same; this is brought about by arrangement of riffle cleats upon the surface of table, extending longitudinally with the diagonal arrangement of tips or terminals, thus presenting the two main surfaces of the table, one of which is the riffled or roughing plane and the other the unriffled or cleaning plane; the ore pulp with the water from the pulp box discharges from the uppermost riffle and the side-wash and end-wise motion of the table causes the material under treatment to flow transversely over the riffled portion and form in bands, as illustrated in exhibit 8; the heavier concentrates settle in the channels where they become stratified in the order of their specific gravity, and the lighter gangue or waste flows over the top of the riffle cleats and discharges from the table in a band; the reciprocating motion of the table causes the concentrate, stratified in the channels between the riffle cleats, to travel forward towards the concentrates discharge end where they form in diagonal bands, the heaviest concentrates extending farther up on the table and forming a line or band nearest the concentrates discharge end, and materials of less specific gravity forming in bands according to their specific gravities between this band and the silica band; on this surface the material is subjected to a side-wash of clear wash-water which washed back the lighter gangue and leaves the concentrates clean and free from silica; [196] the table illustrated in exhibit 4 is so adjusted that the

band of lighter silica extends diagonally and is held by the terminals of the riffled portion, where it affords a support from beneath for the heavier concentrates, which, as they emerge from the channels between the riffle cleats, become sorted and reach their kind in the corresponding bands just beyond the terminals of the riffles. At these terminals of the riffles the doubtful grains of material are subjected to repeated re-examination and retreatment giving repeated opportunity for them to find their proper place, and if they do not become properly classified higher upon the table they have had time and opportunity to become so classified before the lowermost terminals are reached; the relatively smooth or unriffled area extending from the riffle tips to the concentrate discharge end of the deck supports and conveys the cleaned concentrates which have been forced by exposure to wash water to part company with the last remaining particles of the gangue as the riffle tips are approached and reached into the concentrate box, while also supporting and conveying the wash-water as it flows downward to the riffles extending below; in the Wilfley table the essential characteristics are that of a relatively rough area, which area is the riffled portion where the initial work of concentration is performed and the relatively smooth portion where the final separation takes place, a portion which must be smooth enough to permit [197] the side-flow of wash-water to wash away the lighter silica which arises to the top and at the same time sufficiently rough to cause the

(Testimony of Vernon E. Hodges.)

heavier concentrates to cling to this surface and permit the wash-water to flow over it, so that the concentrates retain their position on this surface by reason of a sufficient roughness in it, while the lighter weight is carried over the tailings discharge side of the table; the expression in the specification "smooth, plain and unriffled" is apparently employed to distinguish a portion of the table having these characteristics from a portion which is relatively less smooth and plain, as the two main surfaces of the table have relative characteristics of roughness and smoothness simply to enable them to deal with the conditions required on these two parts of the table; the change between these two surfaces is along a diagonal line which has been made to conform to and take advantage of what had been found to be a natural diagonal arrangement resulting from the forces operating on the table, and by so doing the protection of the material under treatment has been prolonged and is gradually withdrawn, so that in consequence a table of greater capacity and efficiency has been provided; in the specifications of the Wilfley patent reference is made to riffles of unequal length and also to triangular portion A of the table, but nothing found in the patent to indicate this reference to the riffles of unequal length had any [198] special significance beyond an intention to describe the arrangement of the terminals along a diagonal line; no reference is anywhere made in the specification to the opposite or mechanism end of the riffles, the construction of which is non-essential to

the successful and best operation of the concentrator; the expressions "unequal length" and "varying in length" are not intended to refer to the entire portions of the riffles, so much as to the terminals, the intention having undoubtedly been to express the condition of one terminal extending out beyond another, having the effect of unequal length in this regard. The expression "triangular portion," referring to part marked A, in fig. 3 of the Wilfley patent, evidently one of many forms this portion of the table might have taken, not requiring any special form or vast expanse of area.

"Passing now to the Deister table, as shown in Complainant's Exhibit No. 5, drawing, Deister table, in No. 6 Mill of Arizona Copper Company, at Morenci, Arizona, and Exhibit No. 6, model, the table as a whole is rhomboidal in shape or, when compared in a general way with the Wilfley table is composed of an area occupied by the essential working elements of the Wilfley table with the non-essential portion omitted or removed, as is well illustrated by Complainant's Exhibit No. 7–B–D–W. By removing Exhibit 7 A–W, corresponding to the portion marked A of the Wilfley patent in suit, and substituting therefor Complainant's [199] Exhibit No. 7–A–D, at one end, and by removing the portion marked Complainant's Exhibit 7–E–W, which is the least essential portion of the Wilfley riffles of the mechanism end of the table, and substituting therefor Complainant's Exhibit No. 7 E–D.

In this way a table is produced which conforms

(Testimony of Vernon E. Hodges.)

more nearly to the natural diagonal banding, clearly illustrated in Complainant's Exhibit No. 8, photograph, Wilfley table in operation. On the upper edge of this Deister table there is located the feed box, and the wash-water box instead of being in alignment with the pulp or feed box, is brought around in a position over the diagonal concentrates discharge area; so that it parallels, or substantially parallels, the flange or head part at the opposite or mechanism end of the table. Parallel riffle cleats extend from the flange or head part toward the concentrates discharge end, they being formed in three steps or levels, terminating along diagonal lines, the changes between which are indicated by the lines A-A and B-B on Complainant's Exhibit No. 5, drawing, Deister table in No. C Mill of the Arizona Copper Company; so that the channels at and near the concentrate end are very shallow, and as testified to by Mr. Glassbrook, about one thirty-second of an inch in depth on this portion of the table. Alternate riffles terminate a short distance back. By actual dimension it is two inches, and opposite the smooth, plain, and unriffled area thus formed outlets are made in the table for the concentrate, and back of these outlets the flanges are erected and spaces intervene between them, so that the [200] water descending from the wash water box above upon the smooth surface beyond these flanges is deflected around the concentrates outlets upon the smooth, plain and unriffled areas on the table surface adjacent thereto, and for some distance back toward the

(Testimony of Vernon E. Hodges.)
mechanism end of the table. At intervals throughout the riffled surface of the table, and also at the tailings discharge end, higher riffle cleats are arranged and these are numbered in the Exhibit No. 5, Deister table, and one, ten, twenty and thirty-two respectively. At the lower concentrates end of the table a division is made so that the middlings may be taken off at a point between the concentrates outlet and the tailings side discharge of the table. The Deister table has some improved form of head motion whereby it is reciprocated in a direction lengthwise of the riffles and the same transverse flow of water and pulps, and endwise motion and resultant settling, stratifying, conveying and banding is obviously present on this table, as I have fully described in connection with the Wilfley patent and table when in operation, and I find the same main characteristics of relatively rough and smooth areas or riffled and relatively unriffled areas in this Deister table as exemplified by Exhibits 5 and 6, as in the Wilfley invention and table. There are the differences I have mentiones, as well as others which I will mention, which differences from the Wilfley invention and table however [201] are in the non-essentials rather than in the essentials; the essentials of the Wilfley invention and table being present in the Deister table as shown in these Exhibits 5 and 6. One of the differences is in the reduction of the plain, smooth and unriffled portion A of the Wilfley patent to a minimum by removing this corner of the table and terminating it along the diagonal line and a short

(Testimony of Vernon E. Hodges.)

distance beyond the concentrates outlets and swinging the wash-water box from a position in line with the pulp box diagonally across this end of the table, but without omitting or altering any function or essential characteristic of the Wilfley invention.

The inclined surface of the wash-board of the Deister table as represented by Complainant's Exhibits Nos. 5 and 6, is simply a portion of the so-called smooth, plain and unriffled surface of the Wilfley table reduced to a minimum with the same effect of washing back the lighter quartz and gangue, while permitting the concentrates to emerge from beneath and find their way to the outlet and the construction of this table is such that it would cause the formation of the same unbroken bands, the adjustment of riffles being with reference to this object and this alone, the riffles preventing the bands from becoming disrupted when formed and affording the same protection and gradual withdrawal of protection and creating the same detention of silica up to the final line of demarcation beyond which the silica cannot progress further [202] on account of the side-wash of the water which holds and forces it back, but beneath and beyond which the concentrates travel, by reason of their greater specific gravity, which causes them to cling with greater tenacity to the table suface and causes them to progress as a result of the end motion of the table.

There is not only this relatively plain, smooth and unriffled surface practically surrounding the outlets for the concentrates but also the slightly deflecting

channels formed by the thirty-second of an inch thick terminals of the riffles extending a few inches back toward the mechanism end, which presents a relatively smooth, plain and unriffled surface and a surface which has the function of relative smoothness; or, in other words, a surface which is smooth enough to permit the unobstructed side wash of the water from the wash-water box, and at the same time which must be rough enough to facilitate and augment the clinging tendency of the heavier concentrates to the table surface at the concentrates discharge end. This portion of the table at the concentrates discharge end, where the terminals of the advancing riffles are located, would, in the operation of the table, be still smoother, and it would physically appear, owing to the fact that these shallow terminals fill up to their full capacity with concentrates as they pass over this portion of the table.

I find on this Deister table No. 457, as represented by Complainant's Exhibits Nos. 5 and 6, the same surface as disclosed [203] in the Wilfley patent, namely, a riffled surface and an unriffled surface. The riffles extend in the same direction and they terminate along a diagonal line as in the Wilfley patent and construction in a plain, smooth and unriffled surface, or, in other words, a surface which is smooth enough to permit the transverse flow of wash-water film there across, while at the same time, it is rough enough, as in the Wilfley patent and construction to retain, hold, and support the concentrates while the water passes on over them and

(Testimony of Vernon E. Hodges.)

creates the final cleaning and separation. There is in effect the same end motion lengthwise of the riffle cleats, and the same feeds above the uppermost riffles and the location of the wash-water is slightly shifted, namely, to a point nearer the diagonal terminals of the riffles. So that, in this table, there is present the effective operative part of the Wilfley table with an elimination, so to speak, of portions which are not absolutely essential to the operation of concentration under fairly satisfactory conditions. The differences between the Deister table and the Wilfley invention and construction, in a word, is a difference in dimensions and proportions rather than a difference in kind and operation.

Applying the test and comparison of these three claims with the construction of the Deister table as understood and as exemplified in Complainant's Exhibits Nos. 5 and 6, and taking [204] the claims in their order:

First, in Claim 1, a transversely inclined concentrating table having a movement whose tendency is to carry the material longitudinally forward towards the tail or foot of the table. This description accords precisely with the construction here presented.

The second qualification of the claim, namely, the table provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, said riffles varying in length for the purpose specified. The purpose specified is not only stated in the portion of the specification which I have hitherto quoted, but is summarized in the

(Testimony of Vernon E. Hodges.)
following language, commencing with line 43, page 2, of the specification to wit:

"A portion of the gangue—that is to say, the latter part thereof,—passes over the riffles in succession from the shortest or uppermost to the longest or lowermost riffle. The mineral and heavier gangue are caught by the riffles and finally separated on the smooth portion A of the table. This combination in the concentrating tables of riffles of varying length for catching the mineral and a smooth, plain or unriffled portion at the extremities of the riffles where the final separation is effected, through the action of the water, is believed to be entirely new in an apparatus of this class.

[205] "A riffle is the best means of catching mineral, while a smooth plain or unriffled surface is the best for effecting the separation of the mineral from the gangue caught with the mineral by the riffles; the separation being effected by the action of the water."

Referring now to the construction shown in Exhibits 4, 5, and 6 which represent the Deister table, I find the riffles called for by the claim extending longitudinally a portion of the distance from its head towards its foot, said riffles varying in length for the purpose specified—that is to say, varying in length to perform the functions required of the terminals of the riffles, which function is the same and performed in the same way as the Wilfley patent and construction. The claim next recites a smooth, plain or unriffled portion extending from the extremities

(Testimony of Vernon E. Hodges.)

to the riffles toward the tail of the table, whereby the material as it leaves the riffles, is subjected to the action of the water on the smooth portion of the table and the final separation of the mineral from the gangue is effected. The construction on defendant's table is apparently with reference to this same condition and function—that is to say, the surface at the concentrates end and at the terminals of the riffles must be sufficiently smooth to serve as a clinging surface and also to convey the wash-water across the terminals of the riffles and over the bands of concentrates, while at the same time, the surface is not perfectly smooth, but, on the contrary, it is rough [206] enough to hold the concentrates in their progressive travel, due to the motion of the table, over this portion of the table, just as set forth in the Wilfley patent and as practiced in the Wilfley invention. In other words, this effective working part of the Deister table answers the terms of this claim when considered in the light of the description as referred to in the language for the purpose specified, with all the fidelity which any construction, not an exact copy of the Wilfley patent and concentrator, could reasonably do.

Taking the second claim, it first recites "A transversely inclined concentrating table having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot. Second, said riffles being of unequal length, the uppermost being the shortest, while the other riffles increase in length from the upper edge to the lower

edge of the table, the table having a plain or unriffled portion lying at the extremities of the riffles and adapted to receive the material caught by the riffles."

When consideration is given for the fact, as has been testified to by different witnesses, that the lower mechanism corner of the Wilfley table is not absolutely essential to the effective work of ore concentration on that table, then it would seem a perfectly fair conclusion to reach that the variation in length must refer to an active, distinctly operative and essential portion of the [207] riffles, which portion is the terminal ends of the riffles, as those are the ends where the effective final separation is accomplished and where the saving is effected of the doubtful grains, the saving or loss of which goes largely to make up the difference between gains and losses and actual saving in ore concentration. In other words, it seems a perfectly reasonable interpretation to place upon the language of this claim, in view of the specifications and the actual operation of the Wilfley table that the reference made by the language is to the actively operative part of the riffles which continuously advance and terminate beyond those above and along a diagonal line; thus to all intents and purposes making the uppermost the shortest and the lowermost the longest, and the intermediate ones of correspondingly increasing length; and the terms of this claim, therefore, are to be found in the Deister construction.

Comparing the seventh claim with the Deister construction, element by element, as previously stated

(Testimony of Vernon E. Hodges.)

we find the transversely inclined concentrating table having a series of riffles extending longitudinally from the head toward the tail of the table, said riffles of unequal length, the uppermost being the shortest and the riffles increasing in length from the upper to the lower edge of the table, and the table provided with a plain or unriffled portion of suitable area, namely, a portion of sufficient smoothness to perform the function of a so-called plain and unriffled portion created at the extremities of the riffles. Also, there is means present [208] for feeding the material to the upper portion of the table's edge, namely, the pulp-box, and means for discharging the water on the upper edge of the table, namely, the wash-water box, and suitable means for imparting to the table, namely, the head motion, a longitudinal reciprocating movement of a character adapted to move the material from the head toward the tail of the table.

In conclusion of this answer, I do not find any limitation in either of these claims, namely, one, two, and three, to any specific form of riffle. Indeed, the specification emphasizes the fact that patentee, while he prefers the angular form shown and described, yet, that he does not limit his invention to any special construction of riffles. Neither do I discover any limitation to the form and dimensions of the so-called plain smooth and unriffled portion, which portion, while described in the specification and in the only illustration shown as triangular in form, is not so specified in these claims, and it is evident to my mind that it might be of any form and dimension as

(Testimony of Vernon E. Hodges.)
its sole purpose is to act as a cleaning surface and to convey the wash-water to the place where it co-operates in the final separation; and while the words "varying in length" and "increasing in length," as applied to the riffles, are employed in these claims, this language was undoubtedly directed to the actively operative ends of the riffles where the real work of the table is performed, more than to the entire riffle which, at the other end, I apprehend, might have been continued [209] indefinitely and practically without limitation, except that for the purposes of construction, workmanship, economy of space, and perhaps design, was cut off to certain proportions; and I am further confirmed in this view by reason of experiments which have been testified to, which have been made with the Wilfley table in which the lower mechanism end has been entirely cut off and thrown out of commission in the operation of the table. The language employed to define the contrasting surface from that of the riffled area, while the words "smooth, plain, and unriffled" are used in a loose description of this portion, it seems obvious that the language was employed to contrast this portion of the table with the rough portion upon which the riffles or portions performing the riffling function are located, and this view seems to be supported by the fact that a perfectly smooth or too smooth a surface would be ineffective and undesirable, as has been fully tried and tested, such, for instance, as glass, which is a good example of a smooth surface as compared with a surface of wood or lino-

(Testimony of Vernon E. Hodges.)

leum, both of which are more or less rough when compared with glass, or, in fact, a surface having shallow grooves or channels of such slight depth that they necessarily become filled with concentrates, presenting in effect a smooth, plain and unriffled area or surface—that is to say, the surface must necessarily be sufficiently rough to retain the values which are to be saved when they reach that portion of the table while at the same time it must be smooth enough to permit the lighter [210] grains of valueless material to come under the dominating influence of the wash-water and in the final separation which takes place along that portion of the surface of the table.

Therefore, I repeat, and for the reasons which I have stated, the elements set forth in the claims 1, 2, and 7 of the patent in suit are present in the Deister table as is illustrated by model, exhibit No. 6, and the drawing, exhibit No. 5.

Has investigated the subsequent art following the advent of the Wilfley table and finds some fifty subsequent patents which show a clear recognition of the Wilfley type with but slight modifications, showing clearly the combination of a roughing and cleaning plane and control of material along a diagonal line across the table. There is obviously unnecessary expanse of area on that portion of the table designated as the smooth surface A; the language of the claims of the Wilfley patent does not limit the dimensions of this smooth surface, being directed to the co-operation that takes place, due to the material being subjected to the action of the water on the smooth portion as it leaves the riffles; Exhibit 8 il-

lustrates a perfectly clear, generally triangular area at the upper concentrates end of the table over which a thin film of water is flowing, but showing that the area of this surface is unnecessarily large and wide, and that the greater portion of that area [211] of the table is non-essential and might be dispensed with; all that area between the lines marked DD and EE, on exhibit 5, drawing of Deister table, is actually physically smooth or approximately so, and that the entire surface under the water box, defined by the lines CC and EE, to all intents and purposes is smooth; Deister has reduced this area to its minimum proportions and quickly disposes of the concentrates after nothing further in the way of separation can be done with them; Wilfley might have done the same; the idea is to separate the values from the valueless, and after that has been accomplished the manner of disposition of the separated product is entirely secondary consideration; and could even eliminate the more or less sharply-sloping wash-board except as a water conveyor and would still have a smooth surface or smooth area at that end of the table; where the channels are reduced to a depth of one-thirty-second of an inch at this portion of the table it is smooth enough to permit the transverse flow of wash-water and create the final paring off and separation, and yet rough enough to permit the particles to cling and cleave with the required tenacity to maintain their position until they leave the table; Patentee Wilfley, in defining the smooth portion A of the patent, was influenced in the

(Testimony of Vernon E. Hodges.)

choice of his words by the general characteristic of the surface of the table; the term "smooth, plain and unriffled" expresses a distinction between the surface of [212] the table intended to perform a certain work as contradistinguished from another portion intended to do a different part of the work; an obstruction as narrow as these riffle cleats and as low as one thirty-second of an inch, necessarily the spaces are more or less filled with the heavier concentrates, presenting in effect a smooth, plain and unriffled surface; these ends are conveyors or guides, pure and simple, although they are so arranged that they give the appearance of being part and parcel of the riffles; physically they are riffles, but they become so low in height at this point that they no longer do the work of the riffles, but permit the free transverse flow of water to accomplish its work of final separation unhindered, presenting a surface smooth enough for this purpose and yet rough enough as the surface must be to hold the concentrates until the most favorable time for their discharge from the table; what Deister has done is to adopt the essentials or vitals of the Wilfley invention and do away with the non-essentials; if Deister improved the Wilfley table he took nothing away from the essential features of the Wilfley invention; it was not a case of subtraction, but addition and building up upon what Wilfley discloses by his invention; he omitted no function of the Wilfley table, nor did he alter the functions; Deister has steadfastly adhered to those features—the advancing terminals and an area at those terminals

(Testimony of Vernon E. Hodges.)

smooth enough to accomplish what Wilfley's so-called "smooth, plain and unriffled" surface does.

Proofs in Rebuttal.

[Testimony of Charles E. Thompson, for Plaintiff.]

[213] (Defendant's Condensed Statement.)

CHARLES E. THOMPSON

States that he is an employee of the Mine and Smelter Supply Company; that a left-hand No. 2 Deister concentrating table was received November 28, 1911, by said company and placed in its testing room; that he set up and installed said table in said testing plant and assisted in making adjustments and in operating the table on April 18, 19, and 20, 1912, when certain tests and demonstrations were made on it; that Mr. George Hodges, Mr. Vernon Hodges, Prof. Richards, Mr. Scobey, and Mr. Bunce were present during said time and that Mr. Scobey took the notes and memoranda of the said tests and measurements; that "Complainant's Exhibit No. 68 Wilfley Commercial Table" represents the deck of the Wilfley table as manufactured and constructed; that "Complainant's Exhibit No. 67 Wilfley Table deck with riffles terminating at right angles" represents a Wilfley deck with riffles of equal height terminating at right angles to the tailings discharged side.

[Testimony of Henry Eggers, for Plaintiff (Recalled).]

(Defendant's Condensed Statement.)

HENRY EGGERS, Recalled,

States that he is the same Henry Eggers who previously testified in the case; that the general construction and over all dimensions of the Deister No. 2 concentrator in the testing [214] plant of the Mine and Smelter Supply Company and the Deister tables which he had measured in the mills of the Detroit Copper Co. and the Arizona Copper Co. were just about the same.

[Testimony of Jesse Carlton Scobey, for Plaintiff.]

(Defendant's Condensed Statement.)

JESSE CARLTON SCOBEY.

States that he is vice-president of the Henry E. Wood Ore Testing Company, the business of which is that of assaying and engineering, testing ores to develop the best metallurgical treatment and report on ore treatments; that he has been connected with said character of business since 1897 or 1898; that he has had twelve years' experience in superintendence and management of concentrating plants; that he has been familiar with the Wilfley table since 1897 or 1898; that he was present on Aug. 29 to September 2, 1911, and took part in the making of tests and demonstrations on concentrating tables; that he prepared the ore that was used at the tests; that said ore was a standard mixed sulphide ore of lead, iron, zinc, and silica, which was crushed to 16 mesh and

(Testimony of Jesse Carlton Scobey.)

then screened so as to separate the different size products, one being a sand which would pass through a 16-mesh screen and be retained on a 30-mesh screen, another which would pass through a 30-mesh screen and be retained on a 60-mesh screen and a third which would pass through a 60-mesh screen; that in the first test the standard Wilfley table without riffles was operated at 244 revolutions per minute with a stroke of 5/8ths inch, the [215] table being level from end to end and having a cross slope of 3¼ inches in 4½ feet, the material being 16–30 mesh and rate of feed one ton per hour; that the feed was not regular; that "Complainant's Exhibit No. 69" is a photograph taken at the time and represents the conditions as he saw them; that the letter A on the photograph indicates the uppermost point of departure of the mineral at the concentrates discharge end of the table and the letter B indicates the point of marked separation between the mineral and silica as it is discharged from the tailings side of the table, and that between "B" and the mechanism end of the table is the silica discharge from the table; that "Complainant's Exhibit No. 70" represents a run or test on the same table represented by Exhibit No. 69, the length of stroke being now 7/16th inch, the cross slope 3½ inches in 4½ feet, the rate of feed one ton per hour and regular and even; that "Complainant's Exhibit No. 71" is the same as Exhibit No. 70 except that is shows three strings placed on the mineral as it departs from the table to indicate the line of separation of the lead, the iron and the iron zinc mid-

(Testimony of Jesse Carlton Scobey.)

dlings, that A is the band of lead, B the band of iron, C the band of zinc iron middlings and D the silica tailings; that the several lines of demarcation which the strings indicated were clearly observable on the table by the eye; that "Complainant's Exhibit No. 77" as taken of the same table at the conclusion of a test in which ½ ton per hour was fed upon the table, all adjustments being the same as at the previous test shown by [216] Exhibit No. 71; that A on the photograph indicates the lead discharging abnormally at the tailings discharge side of the table, B—the iron concentrates discharging abnormally at the tailings discharge side, C the band of iron-zinc middlings and D the silica; that where there is a change in feed the change in location of the departure of the bands of material is caused by the lack of riffling on the surface, showing that without riffles there is no control of the mineral bands; that in the operation of these tables the end inclination, the cross inclination and the stroke are constant factors, while the change in feed coming to the table is the most varying factor; that a concentrating device must control the shifting of the material due to the change in feed.

Witness states further that Exhibits No. 73 and No. 73–A represent another experiment and data thereon; that the angle of termination of the riffles is 34° 18′, whereas the angle of the standard Wilfley table is 26° 5′; that the upper riffle is much longer in Exhibit No. 73 than on the standard construction; that the feed was one half ton per hour and the upper edge of the band of lead being discharged from

(Testimony of Jesse Carlton Scobey.)
the table is 22¾ inches, the upper edge of the iron is 17¾ inches, the upper edge of the zinc is 8¼ inches and the lower edge of the zinc is 2¾ inches, and the silica is being discharged a distance of 7 feet over the tailings discharged side; that Exhibits 74 and 74–A represent [217] another test in which the feed is one ton per hour, the adjustments being the same as those of the table of Exhibit 73; that in Exhibit 74 the upper edge of the lead is 24½ inches; of the iron 11¾ inches, of the zinc 5 inches, the lower edge of the zinc 2¼ inches and the silica is discharged 9 feet, 10 inches along the tailings discharge side of the table; that the line of demarcation between the zinc and the waste in both Exhibits 73 and 74 is coincident with the riffles; that the additional one-half ton feed widens out the silica and mineral bands over that shown in Exhibit 73; that the mineral bands are probably thicker; that Exhibits 75 and 75–A represent another test with a diagram of the same; that the angle of the advancing terminals of the riffles is 26° 5′; that the upper riffle is 7 feet 3 inches long and the intermediate riffles cut off on a straight line between the terminal of the upper riffle and the point of the table, the adjustments of the table and feed being the same as shown in Exhibit No. 74; that in Exhibit 75 the line of separation is made along the line of termination of the riffles; that the tips of the riffles control or locate the line of separation; that Exhibits No. 76 and 76–A show a line of termination of riffles 30° 35′ from the tailings discharge side of the table, all other adjustments and the feed being the same as

(Testimony of Jesse Carlton Scobey.)

in Exhibit No. 74 and 75; that the line of separation between the minerals and the gangue coincides with the riffle tip termination; that [218] Exhibits 77 and 77–A show a feed of one ton per hour, stroke 7/16ths of an inch, the table was horizontally level and the transverse inclination 5⅝ inches in 4½ feet and the riffles were Z bars ¼ inch high, the angle of the tips being about 26°; that the line of separation between the minerals and gangue is coincident with the line of termination of the riffle tips.

He states further that Exhibits 78 and 78–A represent an experiment and diagram thereof, in which the riffles were of equal length, the feed was one ton per hour, the stroke ¾ths of an inch, the transverse inclination is 5¼ inches; that Exhibits 79 and 79–A represent a similar adjustment and stroke as in Exhibit 78, the feed being one-half ton per hour; that as there is no riffling surface on the last 5 feet 3 inches of the table there is nothing on that smooth surface to control the line of separation; that the riffles being all of the same length have been instrumental mainly in simply conveying the material forward and it practically brings the table in the same condition as that in Exhibits 69 and 71 where there were no riffles upon the table. Counsel here exhibits to the witness Exhibits No. 80 and witness designates on it the bands of material as they depart from the table by the letters A, B, C, and D; witness identifies Exhibit No. 77 and accompanying diagram; and finds in it the operation described in the Wilfley specification of the passage [219] of the

(Testimony of Jesse Carlton Scobey.)
material from one riffle tip to the next below, which feature of operation is not found in Exhibit No. 80 because it lacks the advancing terminals of No. 77; identifies Exhibit No. 81, and states that it shows an approach to the mode of operation of the Wilfley; identifies Exhibits 82 and 84; the conditions of operation were the same in these exhibits except the feed—83 was fed 1 ton per hour, and 82 ½ ton per hour; in 82 material is shown discharging at the tailings side of the table and in 83 partly on the concentrates end and partly on the tailings side; identifies Exhibit 84; it shows the table as it was in 83 except that ⅔ of the riffles had been removed; identifies Exhibit 85; its riffles are all 1/16th of an inch high and not tapered; identifies Exhibits 86 and 87; these were taken of the same test; in 87 there was an additional twine put on to show the location of the tips of the riffles; identifies Exhibit 88 and 88–A, which differ in the character of the material fed; identifies Exhibits 89 and 89–A; they differ from 88 in the inclination of the table and consequent different arranging of banding; identifies Exhibits 90 and 90–A; they differ from 89 and 89–A in the longitudinal grade of the table; identifies Exhibits 91 and 91–A; they differ from 90 and 90–A in the cross inclination of the table; in Exhibit 90 it is ¾ inch and in 91 it is 4½, which is the normal position of the table; identifies Exhibits 92 and 92–A; differ from 91 and 91–A in the rate of feed, being in Exhibit 91 at the [220] rate of 1 ton per hour and ½ ton in 92; identifies Exhibit 93; in this case a Wilfley was

(Testimony of Jesse Carlton Scobey.)

arranged with 1/16 inch Z bar advancing tip riffles not tapered, very light feed; identifies Exhibits 94 and 94–A; it correctly sets forth the dimensions determined by the foregoing test; identifies Exhibits 95 and 95–A; has marked with figures 1–2 the string indicating the diagonal termination of the riffle tips; there was an excess load in Exhibit 95; the same in Exhibits 96 and 96–A; this table shows the standard Wilfley deck equipped with 76 Z-bar, non-tapering riffles with material fed at ½ ton per hour; identifies Exhibits 97 and 97–A; same as Exhibit 96 except rate of feed; difference between 97 and 95 is in the material of the riffles—in Exhibit 95 wooden riffles are used, in 97 Z-bar, non-tapering riffles; identifies Exhibits 98 and 98–A; Exhibit 98 differs from 97 only in the fineness of the feed; identifies Exhibits 99 and 99–A, and marks the commencement of the points of departure from the table of the lead, iron, iron-zinc and middlings; identifies Exhibits 100 and 100–A; same as Exhibit 99; identifies Exhibit 101, it shows the location of samples; identifies Exhibit 102, it shows the assay of material fed on the table; participated in a test made on Deister concentrator No. 2; identifies Exhibits 104 and 104–A; Deister table was set up according to instructions contained in Deister catalogue; identifies Exhibits 105 and 105–A; photographs of Deister Table [221] No. 2; compares that with Exhibit 77 and finds same function main—manifested along the line A A as is shown in Exhibit 77 of the Wilfley; identifies Exhibit 106 and finds the same similarity with Exhibit

(Testimony of Jesse Carlton Scobey.)

77 of Wilfley table; identifies Exhibits 107 and 107–A, and compares 106 and 107, stating that in the case of 106 the table had the standard Deister riffling surface, in the case of 107 the riffles between the lines B B and C C had been removed; the effect of removing the riffles was to allow the bands of material to travel farther down the surface and depart at distances farther down; identifies Exhibits 108 and 108–A; Compares 107 and 108; in both cases the 1/32nd inch riffles beyond the line B B were removed, the only difference being in the transverse inclination; identifies Exhibits 109 and 109–A; and compares 108 and 109; the only difference between them is rate of feed; identifies Exhibits 110 and 110–A, this shows a Wilfley deck with riffles

In connection with the testimony of Mr. Scobey counsel for the plaintiff offered in evidence the following table of exhibits and corresponding photographs:

Exhibit No. 69 is photograph No. 1.
Exhibit No. 70 is photograph No. 2.
Exhibit No. 71 is photograph No. 3.
Exhibit No. 72 is photograph No. 4.
Exhibit No. 73 is photograph No. 5.
Exhibit No. 74 is photograph No. 6.
Exhibit No. 75 is photograph No. 7.
Exhibit No. 76 is photograph No. 8.
Exhibit No. 77 is photograph No. 9.

[222]

Exhibit No. 78 is photograph No. 10.
Exhibit No. 79 is photograph No. 11.

(Testimony of Jesse Carlton Scobey.)

Exhibit No. 80 is photograph No. 12.
Exhibit No. 81 is photograph No. 13.
Exhibit No. 82 is photograph No. 14.
Exhibit No. 83 is photograph No. 15.
Exhibit No. 84 is photograph No. 16.
Exhibit No. 85 is photograph No. 17.
Exhibit No. 86 is photograph No. 18.
Exhibit No. 87 is photograph No. 19.
Exhibit No. 88 is photograph No. 20.
Exhibit No. 89 is photograph No. 21.
Exhibit No. 90 is photograph No. 22.
Exhibit No. 91 is photograph No. 23.
Exhibit No. 92 is photograph No. 24.
Exhibit No. 93 is photograph No. 27.
Exhibit No. 94 is photograph No. 28.
Exhibit No. 95 is photograph No. 29.
Exhibit No. 96 is photograph No. 30.
Exhibit No. 97 is photograph No. 31.
Exhibit No. 98 is photograph No. 32.
Exhibit No. 99 is photograph No. 36.
Exhibit No. 100 is photograph No. 37.
Exhibit No. 101 is photograph No. 38.
Exhibit No. 104 is photograph No. 41.
Exhibit No. 105 is photograph No. 42.
Exhibit No. 106 is photograph No. 43.
Exhibit No. 107 is photograph No. 44.
Exhibit No. 108 is photograph No. 45.
Exhibit No. 109 is photograph No. 46.
Exhibit No. 110 is photograph No. 47.
Exhibit No. 111 is photograph No. 48.
Exhibit No. 112 is photograph No. 49.

(Testimony of Jesse Carlton Scobey.)

of Deister pattern; the effect of this change in the table surface was to make this Wilfley deck identical so far as possible with the Deister No. 2; identifies Exhibit 111 and 111A, and compares with 110 and 110–A; they are identical except in the rate of feed; identifies Exhibits 112 and 112–A, and compares 112 with 111, which are identical except as to the rate of feed; [223] identifies Exhibits 113 and 114.

[Testimony of Robert H. Richards, for Plaintiff (Recalled).]

(Defendant's Condensed Statement.)

ROBERT H. RICHARDS, Recalled,

Discusses the exhibits generally, pointing out specifically the cases in which there was present a control by means of the line of change of detention, which he found in Exhibits 76 and 77, but not in 78 or 84.

(Plaintiff's Condensed Statement.)

ROBERT H. RICHARDS

Says Complainant's Exhibit 69 shows the effect of treating a concentrating ore upon a smooth deck after the manner of the Rittinger table; shows the effect of irregular feed, one moment the feed coming faster, another moment the feed coming slower, and gives an idea of how utterly irregular will be the disposition of the various products, lead, iron, zinc, and silica, along the concentrates end and the tailings side of the table.

Complainant's Exhibit No. 70 shows a Wilfley table with the riffle cleats removed and therefore

(Testimony of Robert H. Richards.)

after the manner of the Rittinger table, without any guide; shows that when very perfectly and evenly fed, more perfectly and more evenly than can possibly be counted upon in mill practice, it does give a beautiful separation, a perfectly even set of bands of lead, [224] iron, zinc, and silica, which can continue to be delivered along the concentrates end and the tailings side with perfect regularity so long as the feed is perfectly even as to quality and quantity and all of the other adjustments are absolutely constant.

Complainant's Exhibit 71 is identical with 70, with the one exception that the strings have been laid on to show the exact position of the dividing lines between the lead, the iron, the zinc middlings and the quartz tailing.

Complainant's Exhibit 72 should be examined in connection with Complainant's Exhibit 71, and it shows what would happen to the table if the amount of feed was changed from one ton per hour as shown in Exhibit 71, to one-half ton per hour, as shown in Exhibit 72. Here the lead concentrate in Exhibit 71 is spread far up upon the concentrates end, where the one ton per hour was fed, and it is spread back a considerable distance on the tailings side where the half ton per hour was fed, as is shown in Complainant's Exhibit 72, a half ton per hour.

Complainant's Exhibit 73, with non-taper riffle cleats 1–16 inch high, having the tips towards the concentrates end ended up on a diagonal line, which is 7 feet 3 inches back from the concentrate end at

(Testimony of Robert H. Richards.)
the feed side and is at the corner between the concentrate end and the tailings side at the other [225] end of the diagonal line. This exhibit is identical with Complainant's Exhibit 74, in all the adjustments with the one exception that Exhibit 73 is fed one-half ton per hour while Exhibit 74 is fed with one ton per hour. Comparing the two there is an extraordinary control of what is called the line of change of detention in the two figures. In 73 the line of change of detention or a line of division between the zinc middling and the quartz tailing is exactly coincident with the diagonal line of advancing terminals. In 74, where the quantity of feed has been doubled, the line of change of detention or the dividing line between the zinc middling and the quartz tailing is exactly coincident with the diagonal line of the advancing terminals of the riffle cleats. If these two figures, 73 and 74, with the diagonal advancing terminals, are looked at in connection with Exhibits 71 and 72, with the advancing terminals, it shows that in changing from 71 to 72, that is, from one ton per hour feed to one-half ton per hour feed, the table has completely changed its disposition of the products, and in Exhibits 73 and 74 that in changing from 73, one-half ton per hour, to 74, one ton per hour, the dividing line between concentrate and tailing has not been changed at all. In other words, something on this table has absolutely controlled the dividing line between the zinc middling, and the quartz tailing, and that something is the diagonal of advancing terminals.

(Testimony of Robert H. Richards.)

[226] In comparing 73 and 74, the question might be asked "What has happened to those two tables when the quantity has changed from a half ton in 73 to one ton per hour feed in 74?" The answer is that the concentrate bands have been widened from a narrower width in 73 to a wider width in 74; that the silica band has widened from a narrower width in 73 to a wider width in 74, and that in those widened bands in 74 has been disposed the extra half ton of feed.

A comparison of Exhibits 75 and 74 shows again an extremely instructive illustration of the very perfect mechanical control of this line of change of detention by the advancing terminals along the diagonal of these riffle cleats. In 74 the upper cleat is cut off 7 feet 3 inches from the concentrates end while the lower cleat goes to the end, and the diagonal runs from the upper to the lower, which is a straight line. In 75 the upper cleat is cut back 10 feet 4½ inches from the concentrates end while the lower cleat goes to the concentrates end, and the diagonal line runs from the end of the upper cleat to the end of the lower, which is a straight line. In comparing these two, 74 fed with one ton per hour, having a steeper diagonal, making an angle of 34 degrees and 15 minutes with the tailing side, and 75, with the gentler slope of diagonal line, making an angle of 25 degrees and 5 minutes with [227] the tailings side, the feed one ton per hour has practically just as perfect control in 75 as in 74. The only difference in the two photographs is that, owing to the gentler

slope of 75, the zinc middling has gone slightly back of the line of terminals, perhaps an inch or two, whereas in 74, with the wider angle, this line of division is exactly on the terminals, showing a remarkable control by mechanical means of the line of change of detention by means of their diagonal termination of the riffle cleats.

Complainant's Exhibit 76 shows an arrangement of riffle cleats in which the upper cleat is cut back 10 feet 4½ inches from the concentrate end, while the lower riffle cleat is cut back a distance of 24 inches from the concentrate end, and the diagonal line of terminals runs from the end of the upper cleat to the end of the lower cleat on a straight line. This again shows a perfect control entirely irrespective of the corner of the table of the line of change of detention between the zinc middling and the quartz tailings along the diagonal of the advancing terminals.

Complainant's Exhibit 77 shows a complete change of riffle cleats. Here the Z-bar cleat ¼ inch high was used, which has been supposed by some commentators to be what was meant by the Wilfley patent, but there is no statement [228] whatever in the patent which says that it should be ¼ inch high. On account of the extreme height of this riffle cleat, namely, ¼ inch, and the coarseness of the sand that was being fed, 16–30 mesh, it was necessary to give this table a greater slope than is usually given to a Wilfley table, in order to produce the regular Wilfley action, namely, the mechanical control of

(Testimony of Robert H. Richards.)

the line of change of detention along the line of advancing terminals on a diagonal line, and this figure shows such a control very perfectly accomplished.

Complainant's Exhibit No. 78 shows a Wilfley deck supplied with riffle cleats ¼ inch square, of uniform height throughout their length, and cut back from the concentrate end 5 feet 3 inches all the way from the feed side of the table to the tailings side of the table. In other words, the diagonal is entirely wanting.

Comparing Complainant's Exhibit No. 78 with Complainant's Exhibit No. 77, there is in Exhibit 77 a complete and perfect control of the line of change of detention, which fixes the position of departure from the concentrate end and the tailings side of the various bands of mineral and tailing. In Exhibit 78 the feed is held in the four upper riffles almost completely, a little has drifted over to the fifth, and [229] then the sands are delivered on to the smooth part of the table without any controlling support of a diagonal formed by the advancing terminals of the riffle cleats.

In order to see the effect of this lack of support or lack of mechanical control, Exhibit 78 must be compared with Exhibit 79, Exhibit 78 having one ton per hour feed, all of the other adjustments being identical in the two cases. This comparison shows that the upper line of the lead concentrate in 78, with one ton per hour feed, is 31 inches up from the corner on the concentrate end; that the upper line of the lead in 78, with half a ton per hour feed, is only 21 inches

(Testimony of Robert H. Richards.)
up from the corner of the table; that the silica extends back in 78, 4 feet 6 inches, where the one ton per hour feed is given, while it only extends back 4 feet from the corner on the tailings side where the half ton per hour feed is given. But a fact of far more importance is that in 78 the line of demarcation between the zinc middling and the silica tailings comes out exactly at the corner of the table, whereas in 79 this line of division or demarcation between the zinc middling and the quartz tailing comes out 10¾ inches back along the tailings side from the corner. This shows a variation of ten inches, due to the change in feed from one ton per hour to one-half ton per hour, all the other adjustments being constant.

[230] It also shows that part of the material that would be coming from the concentrates discharge end in the first two exhibits would be coming from the tailings side in the other.

A comparison of Exhibit 77 with Exhibit 80 shows that in 77, with the diagonal of advancing terminals to control the line of division between the zinc middling and the quartz tailing, the line is perfectly controlled and comes out as desired at the corner of the table, Exhibit 80 differing from that only in the fact that the riffle cleats here are ¼ inch square of wood instead of being Z-bar riffles, but in both cases the riffle cleats are ¼ inch high throughout their entire length, 77 having a diagonal and 80 having the tips cut off square at 5 feet 3 inches back from the concentrate end; the distinction being that the perfect control as shown on 77 throws the concentrate on

to the concentrate side and the tailing on the tailing side as desired, while on 80 the products are all thrown onto the tailing side. The line of demarcation between the zinc middling and the silica is 31½ inches back from the corner of the table.

Complainant's Exhibit 81 represents a Wilfley deck having riffle cleats tapered in thickness as they are all made for the commercial Wilfley table, but ended up on a line that is 6 feet one-half from the concentrate end and parallel [231] to the concentrates end. The line of these terminals, therefore, has no diagonal at all for the control of the line of change of detention.

A comparison of 80 with 81—80 where the riffle cleats are ¼ inch thick throughout their entire length, 81 where the riffle cleats taper to a thin edge at the concentrate end of the cleat—shows that the effect of this taper has been simply to allow the bands of silica, zinc middling, iron and lead concentrate to be moved backward along the tailings side to a considerable greater degree than they were located where the riffle ¼ inch thick extended out to the tip.

Looking at Exhibits 82 and 83 the same riffle cleats appear as shown in Exhibit 81, namely, taper riffle cleats ended upon a line parallel to the concentrate end and 6 feet and ½ inch back from the concentrate end. These two tests are directly comparable as illustrating the lack of control of this arrangement of riffle cleats; 83 has one ton per hour fed to it; 82 has one-half ton per hour fed to it, all the other adjustments are identical.

(Testimony of Robert H. Richards.)

Looking for the line of division between the zinc middling and the quartz tailing, it will be seen on 82, with the lesser feed, that this line is 3 feet 4¾ inches back from the corner of the table on the tailings side; that it is, with the [232] larger feed, one ton per hour, in Exhibit 83, two feet 11¾ inches back from the corner, making a change of 5 inches, it varied 5 inches by the variation in the feed, showing that there is little or no control here, even with the taper riffle cleats, of the position of that line of demarcation between the zinc middling and the quartz tailing, showing with this form having no diagonal line of advancing terminals the mechanical control is wanting.

And that, therefore, the mere tapering of the riffle in and of itself does not serve to control the line of separation.

In Exhibit 84 those same taper riffle cleats are on the table except that two-thirds of them have been removed. The lower cleat is left on, the next two are taken out, the fourth is left on and the fifth and sixth are taken off, and so on all the way up the table from the tailings side. This gives, with one ton feed, Exhibit 84, almost the same result as was given in Exhibit 83, where the complete number of riffle cleats was present. The distance back of the line of separation between the zinc middling and silica tailing in 83, with the complete number of riffle cleats, is 2 feet 11¾ inches. The distance back to the line of division between the zinc middling and the quartz tailing in 84, with only one-third the number of riffle cleats,

(Testimony of Robert H. Richards.)

is 3 feet and ¾ of an inch, a difference of only 1 inch, showing that the fewer riffle cleats do not hold up the [233] starting of the bands quite as much as the larger number.

An interesting comparison can be made between 78, having 13 riffle cleats ¼ inch square throughout their entire length, and 84, having taper riffle cleats. In 78 the riffle cleats are cut back 5 feet 3 inches from the concentrate end, and the terminals end upon a line parallel to that. In 84 the riffle cleats terminate with their thin edge 6 feet and ½ inch from the concentrate end on a line parallel to the concentrate end. Here the thicker tips show their ability to push the starting point of concentration far forward beyond the tip of the upper riffle cleats, whereas in 84, where the taper riffle cleats are used, the concentration started somewhat back in the thin taper riffle cleats. But there is no indication of the slightest control of the line of change of detention in either of these cases.

Complainant's Exhibit 91 has standard Wilfley taper riffle cleats mounted with the standard diagonal line terminating at the corner of the table between the concentrates end and the tailing side. This was fed at the rate of 2,000 pounds or one ton per hour.

Complainant's Exhibit 92 is in all respects the same as 91, with the one exception that it is fed with one-half ton per hour in place of one ton per hour. In 91, with one ton per hour, the line of division between the zinc middling and the [234] silica tail-

ing is coincident with the diagonal of the termination of the tips of the riffle cleats, and in 92, with one-half ton feed, the line of division between the zinc and middling and the silica tailing is along the line of the tips of the riffle cleats on the diagonal. The extra tonnage on 91, where one ton per hour was fed, over the half-ton shown in Exhibit 92, is disposed upon the table in the form of wider bands of the concentrate on the concentrate end and the silica tailing on the tailing side. In 91, with one ton feed, the concentrate is up 17 inches from the corner to the top line of the lead, in 92, where only a half ton feed is given, it is up 13–⅜ inches above the corner to the upper line of the lead. In 91, with one ton per hour feed, the silica band runs back four feet three inches from the corner; on 92, with one-half ton feed, it runs back only 34–½ inches from the corner.

Figure 93 is a photograph without the blue-print, and it shows the supporting effect which the riffle cleats have when terminated in a diagonal line covered by the Wilfley patent upon the sand when fed with a very small amount of sands. The whole of the sand here, whether lead, oron, zinc or silica, is supported beyond the tips of the riffle cleats, leaving a little space between the tips and the bands. By increasing this feed those bands drop right into their normal place, with [235] the line of division between the silica tailing and the zinc middling along the line of the tips.

Complainant's Exhibit 96 shows the regular Wilfley deck mounted with Z–bar riffles 1/16 inch high,

(Testimony of Robert H. Richards.)

non-taper. Here the table is fed with one-half ton per hour and the line of division between the zinc and middling and the silica tailing runs down 5 inches from the corner along the tailing side, the line of division being a little below the line of the tips.

In Complainant's Exhibit 97 the table is identical with 96, using the same Z–bar riffles with diagonal tips along the usual line adopted in the Wilfley commercial tables, and this is fed by 2,000 pounds or one ton per hour. Here the line of division between the zinc middling and the silica tailing is nine and one-half inches below the diagonal. In this pair of photographs representing the two tests it is quite evident that the table was given a little too steep an inclination for the diagonal to hold the line of division right upon the tips. If there had been a little less transverse slope both of these lines would have gone right to the tips, as in the other cases. Here, as in other cases, is shown the disposition of the increased tonnage in 97, fed with one ton per hour, as compared with 96, fed with one-half ton per hour, for the silica band in 97 has spread out 7 feet 8 inches from the corner, whereas in 96 [236] the silica band only runs up 31 inches along the tailing side from the corner. Likewise, the concentrates bands in 97, with one ton per hour, are spread up 25½ inches on the concentrate end above the corner, whereas in 96, with only one-half ton feed, the concentrate is spread up 21¼ inches above the corner.

With respect to the mechanical control of the riffle tips the function is identical then whether you use

(Testimony of Robert H. Richards.)
the rectangular wood riffles 1/16 of an inch high, or the tapering riffles tapering to 1.32 of an inch, or use the Z-bar riffles 1.16 inch high or uniform height, so that the shape or taper of the riffle makes no difference with reference to the performance of the function.

Complainant's Exhibit 104 represents a Deister table fed with 500 pounds per hour. Here the line of control between the zinc middling and the quartz tailing is practically co-incident with the second step-off marked BB on blue print. Complainant's Exhibit 105 represents a Deister table fed with 1,000 pounds per hour (with transverse slope increased).

This increase of slope has pushed the line of division between the quartz tailing and the zinc middling down to the first step-off marked AA on the blueprint, and the string on the photograph is practically coincident from end to end with that line of the first step-off on the riffle cleats.

[237] Complainant's Exhibit 106 has the same slope as Complainant's Exhibit 105, but it is fed with only half the amount of ore, namely, 500 pounds per hour. This appears not to have moved the line of division between the zinc middling and the silica tailing to any appreciable extent. The line on this one is slightly above what it is on Complainant's Exhibit 105, with the larger tonnage, but the amount is only 0.18 of a foot. In 105, with 1000 pounds per hour feed, the line of demarcation between the zinc middling and the quartz tailing is exactly upon the first step-off AA. In 106, where the table was fed with

(Testimony of Robert H. Richards.)

500 pounds per hour, all other adjustments being the same, it is slightly, 19/100 of a foot, in advance of that line, or about two inches.

Complainant's Exhibit 108 represents a changed condition in the Deister table. The thin tips between the line BB and the concentrate end have been removed and the table was run without those tips. The quantity of feed here is 500 pounds per hour and the line of division between the zinc middling and the silica tailing is directly along the second step-off marked BB on the photograph and on the blue print. It is the line of the advancing tips as made after removing those extra parts between BB and CC of the riffle cleats.

A comparison of Complainant's Exhibit 108 with Complainant's Exhibit 104 shows that with the same feed, 500 pounds per [238] hour, but with a slightly different grade, 104 having 31/32 drop in two feet, while 108 has 1–3/32, that is to say, a difference of 4/32 inch in two feet, the line of demarcation between the zinc middling and the silica tailing in the two photographs is practically the same thing, namely, it is along the line BB in both cases—in Exhibit 104, where the extra parts of the riffle cleats are present between the line BB and CC, and in Exhibit 108 where that extra portion of the riffle cleats between BB and CC has been removed. There is a slight difference in the disposition of the bands due to removing those extra portions of the cleats between BB and CC.

In 104, where the extra cleats are present, the lead

(Testimony of Robert H. Richards.)

nearly all comes out of the first discharge hole on the concentrate end. In 108, where those cleats have been removed, the lead band comes out through the first three holes for the discharge of concentrates on the concentrate end. The iron on 104, with the extra parts of the riffle cleats on, goes out through the holes Nos. 2 to 12 on the concentrate end; in 108, where the extra parts of the riffle cleats have been removed, the iron goes out through the holes No. 4 to No. 14 on the concentrate end.

The step-offs along the line AA and BB on the Deister construction have the ability, as disclosed by these exhibits, to control the diagonal line at the upper end of the diagonal [239] line so as to carry it forward at the upper end at an angle which would advance it somewhat further forward even than is shown in Exhibit No. 74, which is an illustration of the carrying forward of the bands somewhat in advance of the normal Wilfley construction, those step-offs have the ability to carry that line even forward on the larger angle, owing to the amount of their ability to control.

Complainant's Exhibit 109 is fed with a very small rate of feed, 167 pounds per hour, and it is comparable with Complainant's Exhibit 108, and especially interesting as exhibiting the ability of the step-off BB to control the line of division for in 108, fed with 500 pounds per hour, the dividing line between the zinc middling and the quartz is exactly upon the diagonal step-off BB from end to end, and in Exhibit 109, fed with only 167 pounds per hour, the line of

(Testimony of Robert H. Richards.)

division between the zinc middling and the silica tailing is coincident with the terminals of the riffled cleats, called the step-off BB, the only exception being at the very lower end where for three or four inches the dividing line springs back towards the silica a little, due to the fact of the removal of a segment of the riffle at that point.

Complainant's Exhibit 110 represents a normal Wilfley Table deck supplied with a set of Deister riffle cleats, made of the same thickness as on the Deister table, with the same [240] three step-offs as on the Deister table, differing in the fact that the large dams, of which there are four, dividing the table into four compartments, extend back to the mechanism end in order to maintain the water level so that the Deister table action may be completely reproduced.

Complainant's Exhibit No. 111 represents the same Wilfley deck with the same Deister riffle cleats upon it, disposed at the same angle, so far as the line of diagonal termination is concerned, as obtains on the Deister table. There appears to be two variables here. The feed in exhibit 110 is 1,000 pounds per hour and the slope transverse to the riffle cleats is 1–3/32 inches in two feet. On this test the line of division between the zinc middling and the silica tailing was along the step-off AA with the exception that a little of the silica ran over the line in places, particularly at a distance three-fourths of the way down from the feed side toward the tailing side. In exhibit 111 the feed was 500

pounds per hour instead of 1,000, and the slope was three-fourths of an inch in two feet transversely to the riffle cleats; and in this case the line of demarcation between the zinc middling and the silica tailing is directly along the line of the second step-off BB, the change from AA to BB being due to the less slope.

In Complainant's Exhibit 112 the conditions were identically **[241]** the same as in 111, with one exception, that the feed which was 500 pounds in 111 was 167 pounds per hour in 112. The line of division between the zinc middling and the silica tailing here was coincident with the second step-off BB in exhibit 112, with the lesser feed, exactly the same as it was in 111 with the greater feed. The quantity of feed was so small that it is a little difficult to see it upon the photograph, the riffle cleats standing up uncovered by sand all the way from the feed side to the tailing side, but a careful examination of this in the run convinced witness that it represented the line of demarcation, namely, the second step-off BB, the line of demarcation between the zinc and the silica.

Referring to the functions described in the specification of the Wilfley patent in suit and to the photograph, exhibit No. 77, illustrating the patent construction in operation, says that the exhibit illustrates the function described in the specification commencing on next to last line on page 1, and concluding on line 56, page 2; shows the gangue with streaks of mineral contained therein passing

(Testimony of Robert H. Richards.)

from advancing riffle tip to advancing riffle tip below, progressively, down the ends of diagonal riffles; that exhibits 105 and 106 of the Deister table in operation both disclose that action on the line AA or the first diagonal line of step-offs; during [242] the time tests were being made, which are illustrated in these photographs, this action was very apparent to the eye along the line indicated in these photographs. Line of control in the construction of the Wilfley patent is present as a function, not as a mere theory, but a matter of fact. There isn't any line of mechanical control of the change of detention present in the Blatchly and Kustel construction; no function of mechanical control, nor repeated washing disclosed in the Lampert patent, as described in the Wilfley patent in suit; does not know of anything in the prior art disclosed in this case that teaches the functions of the invention of Wilfley other than disclosed by Wilfley patent itself; the same enrichment of material takes place as it progresses from ends of riffle tips to concentrates discharge end on the smooth linoleum surface of the Wilfley table, as testified to by Witness Kiddie for defendant, with respect to the Deister table, between lines BB and CC, or the end of the table.

[Testimony of Walter H. Bunce, for ~~Defendant~~ Plaintiff.]

[243] (Defendant's Condensed Statement.)

WALTER H. BUNCE

States that he is a consulting engineer by profession, living at Hartford, Conn.; is familiar with

(Testimony of Walter H. Bunce.)

the Wilfley table; agrees with Dr. Richards as to the automatic control of the line of change of detention of material on the surface of that table.

(Plaintiff's Condensed Statement.)

WALTER H. BUNCE.

Was present when tests were made on the Deister table in testing plant of complainant and closely observed adjustments and operations of Wilfley table deck with riffles of the Deister type placed upon the surface; assisted Witness Scobey in taking measurements of the tests and believed the notes accurate and records made and observed; comparing exhibit No. 77 with Exhibits Nos. 105 and 106, the latter show the functions illustrated in the former—the repeated washing of material described in the specification of the Wilfley patent; in his observation of the Deister table in operation the condition and performance of the function illustrated in Exhibit No. 77 appeared very clearly; in Exhibits 107 and 108 of the Deister table, with thin riffles removed between lines BB and CC, the function referred to continued to be performed by end of riffles terminating on the line BB; the thin riffles between lines BB and CC seem to serve as guides for conveyors; on Deister tables in tests referred to mineral bed became separated from gangue on the line BB, passed forward, and wash-water flowed over it; there might have been traces of silica, but not in material quantities; the concentrate as it moved out on the portion of the table

(Testimony of Walter H. Bunce.)

covered with these riffles would be called a finished product.

[Testimony of Vernon E. Hodges, for Plaintiff (Recalled).]

[244] (Defendant's Condensed Statement.)

VERNON E. HODGES, recalled,

States that since his former deposition he has seen the Deister table; adheres to his former statement that concentration on that table is complete at the line BB; he might have said *commercially complete;* states that the Wilfley patent means that one part of the table is riffled and the other *smooth enough, plain enough,* or *unriffled enough* to cooperate with the riffles of unequal length, which means unequal in length as to the terminals to accomplish the functions required of the Wilfley patent, which functions he finds performed in the same manner on the Deister table as illustrated in Exhibits 106 and 107; has seen demonstrations made on Blatchly and Kustel construction; difference between it and the Wilfley is that its riffles all terminate on a line at right angles to the central longitudinal axis or direction of motion without the advance at the terminals, so that no provision was made for catching and retreating.

(Plaintiff's Condensed Statement.)

VERNON E. HODGES

States that Wilfley was a leader; his invention was emphatically an advanced stride in the art of ore concentration; that all the art that can be discovered, which is in anywise similar to Mr. Wilfley's

(Testimony of Vernon E. Hodges.)

construction has originated since **[245]** the Wilfley patent—none before it, would seem a satisfactory reason for position that Wilfley made a radical departure from his predecessors in the art; the Rittinger surface referred to by defendant's witness Browne does not show a construction having any means of control—only has a plain surface; Blachly and Kustel don't have the Wilfley invention, nor does Lampert; neither have any provisions whereby the function of repeated catching and re-washing of material is possible; Wilfley was the first to do this; Wilfley does not claim to have invented a smooth surface per se, a riffled surface per se, nor a combination of riffled and smooth surface per se, but what he has disclosed and claimed and what is required in the process and apparatus, as outlined and set forth in his patent, is a co-action of two surfaces which together produce the function of the patent, namely, the re-treatment and re-washing as the material reaches out beyond the end of one riffle cleat and finds beneath another ready to catch it and admit of its re-treatment until the operation is completed and altogether effective: Wilfley first accomplished in his invention and patent this primary function and devised the instrumentalities for accomplishing it; in claiming this invention nothing is said, and there are no limitations as to **[246]** the length of riffles, size of parts and triangular shape of one of the surfaces, the degree of roughness or smoothness; these features while contributing to the general result, are not minutely

(Testimony of Vernon E. Hodges.)

specified, nor is the Wilfley patent limited to the non-essentials which defendant's witness Browne seems to emphasize, discussed the file wrapper and contents of the Wilfley patent, in conjunction with the testimony of defendant's witness Browne, and in witness' opinion so far as the essence of the Wilfley invention is concerned, as disclosed in his patent, nothing was done by the patent examiners which in any way restricts or limits him as to the essence of his invention and the citation of the Blatchly and Kustel patent did not narrow or restrict Wilfley in the scope of his invention as understood by witness.

[Defendant's Record Condensed and Simplified.]

[247] *In the District Court of the United States for the District of Arizona.*

Nos. 11 and 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

THE DEFENDANT'S RECORD CONDENSED AND SIMPLIFIED IN COMPLIANCE WITH PARAGRAPH (b) OF RULE 75 OF THE EQUITY RULES.

[248] *In the District Court of the United States for the District of Arizona.*

Nos. 11 and 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant,

Summary of Evidence.

The above-named cases are in effect one; the same

proofs apply to them, all contained in one record, and taken under an agreement that the same proofs should apply to both cases; and the following summary of the evidence made in obedience to rule 75 of the Equity rules is to stand for both cases alike.

[Testimony of Norman Carmichael.]

[249] NORMAN CARMICHAEL

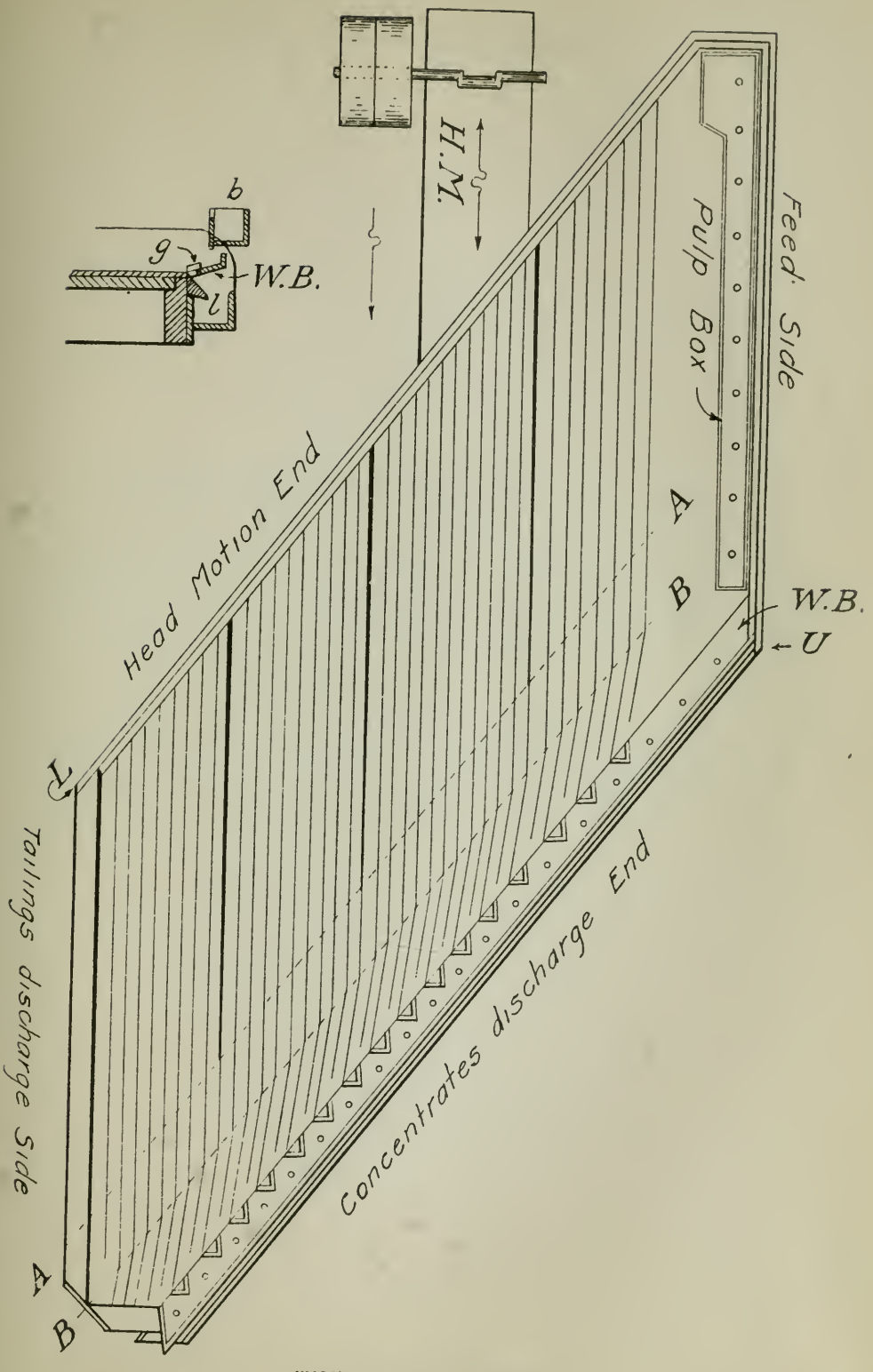
Stated that he was general manager of the Arizona Copper Company; that in the process of mining as carried on by that company the ore was first broken down and the richest pieces sent direct to the smelter; the residue was crushed again and treated on jigs; then ground in Huntington mills; then passed through a classifier, from which the first product is treated on Wilfley tables and the second on Deister tables and the third on vanners; and that about 38% of the copper recovered from the ore is reclaimed in the form of concentrates from the tables and vanners.

On cross-examination he stated that the minerals occur in veins or streaks in the rock known as monzonite porphyry; the concentrates are about 16% copper; 22 to 25% iron, and 26 to 28% sulphur.

[Testimony of John Kiddie.]

JOHN KIDDIE

States that he is mine and mill sampler and chief assayer for the Arizona Copper Company; that the company has in use Deister tables and Wilfley tables, with the operation of both of which he was familiar. At this point counsel put in the hands of the witness a drawing which at the conclusion of his examination in chief was put in evidence, marked, "Defendant's Exhibit Deister Table Drawing."



THE DEISTER TABLE.

Defendant's Exhibit Deister Table Drawing.

[Endorsed]: Mine and Smelter Supply Co. vs. Arizona Copper Co. Defendant's Exhibit Deister Table Drawing. J. O. Thomson, Special Examiner. Filed Nov. 19, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

No. 2291. U. S. Circuit Court of Appeals for the Ninth Circuit. Defendant's Exhibit Deister Table Drawing. Received Jul. 26, 1913. F. D. Monckton, Clerk.

(Testimony of John Kiddie.)

[249¼] Q. I will now put in your hands a drawing which is intended to show a top view of one of your Deister concentrating tables. In this drawing the feed side and tailings discharge side, and head motion end and concentrates discharge end, are indicated in words. There is shown, on the feed side, a pulp box, with perforations in the bottom of it, by which pulp is delivered upon the surface of the table. At the head motion end there is shown a pulley and indicated a shaft marked H. M. On the surface of the table are shown a number of riffles extending from the head motion end of the table to the concentrates discharge end. Four of those riffles, indicated by heavy lines, are higher than the others, and taper from the base toward the tip to the dotted line A A. The riffles between the high riffles are of uniform height from their base to the dotted line A A, except those in the upper group between the pulp box and the first high riffle. The riffles of that group are a little higher than those of the groups below, and a little further apart. At the line A A the riffles are all of the same height. Between the lines A A and B B the riffles are little lower than those above, and all of the same height. Between the line B B and the terminals of the riffles they are all of the same height, and lower than those in the zone between the lines A A and B B. The edge of the table proper is along the line C C. Adjoining [249½] that line, and fitted up snugly to the edge of the table, is a wash-water board W B, which is indicated by those letters at the two ends of the board. This is a plain board

(Testimony of John Kiddie.)

fitted snugly against the edge of the table, and having a sharp slope toward that edge. A number of perforations are made in the edge of that board close to the edge of the table. These perforations open down into a box underneath for the reception of the concentrates produced in the operation of the table. Above each of these perforations is a little raised triangular guard to prevent water flowing down the board from flowing into the perforations. The riffles alternately extend to the edge of the table and stop off a couple of inches back from the edge. Each one of the riffles which extends to the edge of the table, registers with one of these openings, so that the concentrates coming down the riffle trough, above the riffle, are delivered into the opening. There is, fixed above this wash-board a water box not shown in the main drawing, but shown in cross-section above. In this little drawing, b indicates the water box; W B the wash-board. The water box has notches in it, of which one is shown, from which water runs out and falls in small streams on the surface of the wash-board. The points where these [249¾] little streams fall on the wash-board are indicated by small circles in the main drawing.

In use, the table is so placed that the corner marked U is the highest point on the table, and there is a descent from that point across the riffles, substantially at right angles to them, over the whole surface of the table. The concentrates discharge end is also elevated slightly—something like three-quarters of an inch above the head motion end. In operation the

(Testimony of John Kiddie.)

head motion imparts to the table a to-and-fro oscillation of such character as to cause the material on its surface to tend to travel along the riffle troughs towards the concentrates discharge end. The water box is kept supplied with water which, falling in gentle streams on the wash-water board, keeps its surface covered with a quiet film of water, flowing down over the edge of the board, flows down across the riffles, substantially at right angles to their direction, to the tailings discharge. The water flowing down from the wash-water board, meets the material under treatment as it advances towards the concentrates discharge end, and washes back from the edge any grains of sand that might tend to go into the concentrates discharge openings. After [250] consideration of this drawing, you may state whether or no it represents, with substantial accuracy, the Deister concentrator tables in use in the works of the defendant.

A. I could say that I know that this is substantially a correct representation of the Deister table that we use.

The witness then takes up certain statements made by Vernon E. Hodges, expert for the plaintiff, in which he (Hodges) stated in testifying about the Deister table in reference to the spaces between the line BB and the edge of the table occupied by the low riffles 1/32nd of an inch high, that he did not admit that those portions contributed to concentration, that separation was not going on in those shallow channels, that it was complete before the material reached

(Testimony of John Kiddie.)

those channels, and in answer to these statements of Mr. Hodges Mr. Kiddie stated that he had many times observed the operation of the Deister table and observed that fine grains of sand were being washed over the low riffles practically all the time from the line BB to the concentrates discharge edge; that at that stage of concentration the finest grains of sand remained to be removed and were removed by the water washing the sand over the low riffles and the motion of the table propelling the concentrates forward to the discharge. The witness stated that he made some tests to show whether or not concentration was going on between the shallow riffles and described one of those tests. He said he made two small, thin scoops [251] to fit between two of the riffles, with their edges filed sharp. Those scoops were placed between two riffles with their sharp edges pointed toward the mechanism end, one near each end of the riffles and two jets of water were provided arranged with rubber tubing and glass tips, and with those jets the concentrates between the riffles and extending some distance ahead of the scoop were washed into the scoop and caught; those two samples were taken simultaneously; the scoops were made to fit closely in the space between the riffles; the two samples were taken at a time when the table was in normal and regular operation; the taking of a sample took only a fraction of a minute; he made a memorandum of the tests made by him in writing, which is in evidence; in explanation of the memorandum he stated that under each of the headings "Scoop A"

(Testimony of John Kiddie.)

and "Scoop B" there was a column headed % Cu. and one headed % ins., which mean per cent copper and per cent insoluble; the insoluble is that portion of the sample that is not soluble; in nitric and hydrocholoric acid; that, for example, the figures in line 1 under scoop A signify that of the sample taken out 12.44 per cent by weight, dried, was copper, and 59.26 per cent by weight was insoluble material, mostly silica.

[Testimony of Gilbert H. Davidson.]

GILBERT H. DAVIDSON

States that is is head carpenter in the works of the Arizona Copper Company; has seen sand with the naked eye passing over the low riffles on the Deister table; that both concentrates and sand [252] can be seen passing over.

[Testimony of W. A. Moore.]

W. A. MOORE

States that he is mill superintendent for the Arizona Copper Company; the process of concentration is not complete when the material crosses the line of the second step down in the riffles on the Deister table; you can see concentrates and sand passing over the riffles in that part of the table; the sand is very fine and is light colored.

[Testimony of Rudolph Gahl.]

RUDOLPH GAHL

States that he is in charge of experimental work for the Detroit Copper Mining Company; is familiar with the Deister concentrators in use by that com-

(Testimony of Rudolph Gahl.)

pany; in a normal running table the concentration of the material which passes the second stepdown is not complete at that point; some sand remains to be taken out; it can be seen passing over the low riffles. Counsel exhibits to witness a drawing marked "Defendant's Exhibit Drawing of Deister Table and Record of Tests of its Output"; witness states that these tests were made under his direction; the concentrates were taken off in his presence from one of the Deister tables in the regular operation in the works of the Detroit Copper Mining Company; the table was running in its ordinary and normal manner; the samples were dried, weighed and assayed; the assaying was done at the smelter assay office of the Detroit Copper Mining Company.

[Testimony of George Nord.]

[253] GEORGE NORD

States that he is in the employ of the Detroit Copper Company; the concentration of material on the Deister table is not complete until it comes to the end where the concentrates go into the concentrates box; when the table is in operation sand can be seen passing over the thin riffles.

[Testimony of Earle Schuyler.]

EARLE SCHUYLER

States that he is millman in the employ of the Detroit Copper Mining Company of Arizona; is familiar with Deister table No. 2 and had noticed the part occupied by the very thin riffles; that silica washes over those riffles; can see it when the table is in its regular and normal operation.

[Testimony of Gustavus E. Hunt.]

GUSTAVUS E. HUNT

States that he is superintendent of the concentrator of the Detroit Copper Mining Company; is familiar with the Deister concentrator No. 2; has noticed the action taking place between the thin riffles on that table; there is a continuous concentration taking place there all the time; the silica or sand can be seen with the naked eye passing over those low riffles; 38 Wilfley tables are used in the Detroit Copper concentrators; has had opportunity to compare the Wilfley and Deister tables at work; produces drawings of the standard Wilfley table and Deister No. 2 [254] marked "Defendant's Exhibit Dimensions of Wilfley Table" and "Defendant's Exhibit Dimensions of Deister Table"; the standard established weights of the tables are about 1800 lbs. crated for the Wilfley table and 1500 lbs. crated for Deister; would make no distinction between the tables as to amount of work, give them the same load each; it has sometimes happened that the thin riffles on the Deister table have worn down so that the concentrates would tend to flow down to the tailings discharge; have tried the experiment of putting riffles on the Deister table 1/16th of an inch high between the line BB and the concentrates discharge for the treatment of coarser material, and for that kind of material it proved to be an advantage.

[Testimony of John Kiddie (Recalled).]

JOHN KIDDIE, Recalled,

States that in January, 1909, he made a comparative test of a Wilfley and Deister machine; it was

(Testimony of John Kiddie.)

done under the direction of Mr. Carmichael, the general manager of the Arizona Copper Company; that a Deister and a Wilfley table were set up and were run on a feed which was divided by an automatic device equally to the two machines; concentrates from each machine were saved for the run, and dried, weighed and sampled; and during each run the tailings and feed were sampled at regular intervals; from this data the relative efficiencies were figured; the test extended over 12 days and the average was about two hours per day; we assayed samples of the products, and also of the tailings; all the [255] facts of the tests were tabulated; produces the record marked "Defendant's Exhibit Record of Comparative Tests of Wilfley and Deister Ore Concentrators."

[Testimony of Ellis W. Honeyman.]

ELLIS W. HONEYMAN

States that he was chief chemist of the smelter of the Detroit Copper Mining Company at Morenci, Arizona; he regularly receives samples from Dr. Gahl; produced a blue-print marked "Defendant's Exhibit Drawing of Deister Tables and Record of Tests of Its Output," containing a drawing of the table and a tabulation referring to a series of samples and containing a record of those samples, which samples pass through his hands; made a record of the assays which he has compared with the table and which is correct.

[Testimony of Arthur S. Browne.]

ARTHUR S. BROWNE.

Preliminary to his deposition counsel for the defendants put in evidence a certified copy of the filewrapper and contents of the Wilfley patent in suit, and the same was marked for identification "Defendant's Exhibit Certified Copy of Filewrapper and Contents of the Patent in Suit."

Witness then states that he is a patent solicitor and expert residing at Washington, D. C.; he has seen the Wilfley table in operation, and also the Deister table in use at Morenci, Arizona; in his opinion the Deister table does not have the elements of claims 1, 2 and 7 of the Wilfley patent; [256] discusses the von Rittinger table, the patent to Blatchly and Kustel No. 258,879, June 6, 1882, and Lampert No. 533,362, Jan. 29, 1895; discusses the deposition of Vernon E. Hodges, expert for the plaintiff; enumerates his four theories to the effect (1) that that portion of the Deister table having riffles only 1/32d of an inch high constitutes a smooth, plain, or unriffled surface as called for by claims 1, 2, and 7 of the Wilfley patent, that when Wilfley refers to one portion of the table as being riffled and smooth, or being unriffled, he merely means that one portion of the table is relatively rougher than the other; (2) that the Deister table may be regarded as a number of small Wilfley tables and that each of the small space at the end of one of the alternate riffles constitutes the smooth, plain, or unriffled portion called for by the Wilfley claims; (3) that these

(Testimony of Arthur S. Browne.)

small areas plus the inclined surface of the wash water board constitue the plain, smooth, or unriffled portion called for by the Wilfley claims; (4) that the aggregate of all these small areas constitute together the smooth, plain, or unriffled portion called for by the Wilfley claims. Witness then discusses at length each of these theories and expresses his dissent from it with argument as to each.

At the close of Mr. Browne's deposition counsel for the defendant put in evidence U. S. patent No. 258,879, to Blatchly [257] and Kustel, June 6, 1882, and U. S. patent to Lampert, No. 533,362, Jan. 29, 1895, which are marked respectively, "Defendant's Exhibit Blatchly & Kustel Patent 258,879," and "Defendant's Exhibit Lampert Patent 533,362."

[Testimony of William H. Bensman.]

WILLIAM H. BENSMAN

States that he is secretary, treasurer and manager of the Deister Concentrator Company; indentified drawing placed in his hands by counsel and states that it is a correct representation of Deister table No. 2 in its latest form of concentration; the drawing referred to by the witness is put in evidence by counsel for the defendant and marked "Defendant's Exhibit Blue Print Drawing."

[Testimony of Edward J. O'Connell.]

EDWARD J. O'CONNELL

States that he is second vice-president of the Deister Concentrator Company and performs the duty of salesman and table demonstrator; the Deister Concentrator No. 2 will handle as much feed and

(Testimony of Edward J. O'Connell.)

can be operated with less care and attention and less power than any other table; in the operation of the Deister table the clean concentrate is removed from the table as fast as it is made.

[Testimony of Frazer D. Reid.]

FRAZER D. REID

States that he lives at Cobalt, Ontario, Canada, and is a mill superintendent; has used Deister concentrator No. 2 for the [258] recovery of silver values; enumerates the following advantages which he has found to be possessed by the Deister concentrator— (1) its small area; (2) top does not bow nor get out of alignment, (3) top can be readily handled by two men, (4) practically no waste in changing linoleum as it wears evenly in every part, (5) table is not sensitive to irregular feed, (6) works well with two or more minerals of different specific gravities; (7) makes a clean concentrate with very little attention; once properly set will run for long periods with no attention except to oil the bearing surfaces.

[Endorsements]: Nos. 11 and 12. In Equity. In the District Court of the United States for the District of Arizona. The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company and The Arizona Copper Company, Corporations, Defendants. Condensed Statement of Evidence. Filed June 9, 1913. Allan B. Jaynes, Clerk. By F. E. McCrary, Deputy.

[Endorsements]: Nos. 11 and 12. In Equity. In the District Court of the United States for the District of Arizona. The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company and The Arizona Copper Company, Corporations, Defendants. Further Condensed Statement of the Evidence to be Included in the Record on Appeal. Filed June 17, 1913. Allan B. Jaynes, Clerk. By F. E. McCrary, Deputy.

[Defendant's Praecipe for Transcript of Record on Appeal.]

[259] *In the District Court of the United States Within and for the District of Arizona.*

Nos. 11 and 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Plaintiff,

vs.

ARIZONA COPPER COMPANY, a Corporation,

Defendant.

To the Clerk of the Above-entitled Court:

You will please prepare a transcript of the record

in the aforesaid causes, making a single transcript for [260] both causes and entitling the same as above, to be filed in the office of the clerk of the United States Circuit Court of Appeals for the Ninth Circuit under the appeal heretofore perfected to said court, and include in said transcript the following pleadings, proceedings and papers on file, to wit:

All orders, judgments and rulings made in each, either or both of said above-mentioned causes as the same appear on the records of said District Court for the District of Arizona;

All pleadings filed by the parties in said causes;

The testimony in said causes in the condensed and simplified form in which it has been prepared for this appeal by the appellant in obedience to paragraph (b) of Equity rule 75 under the approval of the Court.

You are further directed to transmit with the record without copying all the original exhibits on file in said causes, including paper exhibits on certified copies of public documents, photographs and mechanical exhibits put in evidence by either of the parties, among which are to be included the bound volume [261] entitled "BOOK OF COMPLAINANT'S PAPER EXHIBITS, DRAWINGS AND PHOTOGRAPHS," and the following exhibits introduced in evidence by the defendant, to wit:

"Two Metallic Scoops."

"Defendants' Exhibit Blue-print Drawing Illustrating Method of Taking Samples."

"Kiddie's Report of Tests."

"Defendant's Exhibit Drawing of Deister Table and

Record of Tests of Its Output."

"Defendant's Exhibit Dimensions of Wilfley Table."

"Defendant's Exhibit Dimensions of Deister Table."

"Defendant's Exhibit Record of Comparative Tests of Wilfley and Deister Ore Concentrators."

"Defendant's Exhibit Comparative Concentrating Surface of Deister and Wilfley Tables."

"Defendant's Exhibit Seven Samples of Concentrates Referred to in Testimony of Rudolph Gahl."

[262] Said transcript to be prepared as required by law and the rules of this court and the rules of the United States Circuit Court of Appeals for the Ninth Circuit, and on file in the office of the clerk of the said Circuit Court of Appeals, San Francisco, California, on or before July 15, 1913.

ROBERT S. TAYLOR,
ELWIN M. HULSE,
Solicitors for Defendant.

[Endorsements]: Nos. 11 and 12. In Equity. In the District Court of the United States Within and for the District of Arizona. The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company of Arizona, a Corporation, Defendant, and The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Arizona Copper Company, a Corporation, Defendant. Praecipe. Filed June 11, 1913. Allan B. Jaynes, Clerk. By Frank E. McCrary, Deputy.

[Complainant's Praecipe for Transcript of Record on Appeal.]

[263] *In the District Court of the United States for the District of Arizona.*

No. 11—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Defendant,

and

No. 12—IN EQUITY.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Complainant,

vs.

ARIZONA COPPER COMPANY a Corporation,

Defendant,

To Allan B. Jaynes, Clerk of the District Court of the United States Within and for the District of Arizona.

In preparation of the transcript of the record in the above-entitled causes, to be filed in the office of the Clerk of the United States Circuit Court of Appeals for the Ninth Circuit, under the appeal heretofore perfected to said Court by the defendants in

said causes, in addition to the [264] testimony set forth in the condensed and simplified form prepared for said appeal by the solicitors for the defendants or appellants in accordance with the praecipe filed by the said solicitors, you will please include in such transcript as supplementing and by way of addition to the testimony set forth in said condensed and simplified statement of the defendants or appellants the testimony set forth in the "Further Condensed Statement of the Evidence to be Included in the Record on Appeal," prepared by solicitors for the complainant or appellee in said causes, which is tendered and filed herewith.

GEORGE L. HODGES,
D. EDGAR WILSON,
Solicitors for Complainants.

[Endorsements]: No. 11 and 12. In Equity. In the District Court of the United States for the District of Arizona. The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Detroit Copper Mining Company of Arizona, a Corporation, Defendant, and The Mine and Smelter Supply Company, a Corporation, Complainant, vs. Arizona Copper Company, a Corporation, Defendant. Filed June 17, 1913. Allan B. Jaynes, Clerk. By F. E. McCrary, Deputy.

Certificate of Clerk U. S. District Court to [Transcript of Record, etc.]

[265] United States of America,
District of Arizona,—ss.

I. Allan B. Jaynes, Clerk of the United States District Court for the District of Arizona, do hereby certify that the foregoing pages numbered from 1 to 264, inclusive, together with book of plaintiff's paper, exhibits, drawings, and photographs, Plaintiff's Exhibit 6, Plaintiff's Exhibit 7, Plaintiff's Exhibit 7 AW, Plaintiff's Exhibit 7AD, Plaintiff's Exhibit 65, Plaintiff's Exhibit 66, Plaintiff's Exhibit 67, Plaintiff's Exhibit 68, and the following Defendant's exhibits:

"Two Metallic Scoops."

"Defendant's Exhibit Blue-Print Drawing Illustrating Method of Taking Samples."

"Kiddie's Report of Tests."

"Defendant's Exhibit Deister Table Drawing."

"Defendant's Exhibit Drawing of Deister Table and Record of Tests of Output."

"Defendant's Exhibit Dimensions of Wilfley Table."

"Defendant's Exhibit Dimensions of Deister Table."

"Defendant's Exhibit Record of Comparative Tests of Wilfley and Deister Ore Concentrators."

"Defendant's Exhibit Comparative Concentrating Surface of Deister and Wilfley Tables."

"Defendant's Exhibit Seven Samples of Concentrates Referred to in Testimony of Rudolph Gahl."

—constitute and are a true and complete transcript of the record in the case of The Mine and Smelter Supply Company, a Corporation, Plaintiff, vs. The Detroit Copper Mining Company, a Corporation, Defendant, and The Mine and Smelter Supply Company, a Corporation, Plaintiff, vs. Arizona Copper Company, a Corporation, Defendant, numbers 11 and 12, in Equity, and I also annex and transmit the original citations in said cases. I further certify that the cost of preparing and certifying to said transcript of the record amounts to the sum of $162.70, and that the same has been paid in full by the defendants and appellants, The Detroit Copper Mining Company of Arizona and The Arizona Copper Company.

In testimony whereof I have hereunto set my hand and affixed the seal of said District Court at the City of Phoenix, in said District of Arizona, in the Ninth Judicial Circuit this 22d day of July, A. D. 1913, and the Independence of the United States of America, the 138th.

[Seal] ALLAN B. JAYNES,
Clerk United States District Court, District of Arizona.

[Citation on Appeal of Detroit Copper Min. Co. (Original).]

In the United States District Court for the District of Arizona.

No. 11.

United States of America,—ss.

The President of the United States of America to The Mines and Smelter Supply Co., a Corporation.

You and each of you are hereby cited and admonished to appear in the United States *Circuit of* Appeals for the Ninth Judicial Circuit within thirty (30) days from the date of this writ, pursuant to the appeal duly obtained and filed in the Clerk's office of the United States District Court for the District of Arizona, wherein you are appellees and Detroit Copper Mining Company of Arizona is the appellant, to show cause, if any there be, why the order and decree in said appeal mentioned should not be reversed and corrected, and why speedy justice should not be done to the parties in that behalf, and to do and receive that may appertain to justice to be done in the premises.

WITNESS, The Honorable WM. W. MORROW, Judge United States Circuit Court of Appeals, Presiding as Judge of the United States District Court for the District of Arizona, this 15 day of May, 1913.

WM. W. MORROW,
Judge.

United States of America,
District of Colorado,—ss.

I hereby certify that I have duly executed the within writ as follows, to wit:

As to The Mines and Smelter Supply Company by delivering to Albert H. Seep, personally, as the Vice-president of the said The Mines and Smelter Supply Company, a true copy of the within writ at Denver in said District on the 12th day of June, A. D. 1913.

Fees and Costs: $2.00.

D. C. BAILEY,
U. S. Marshal.
By E. B. Chadwick,
Deputy.

[Endorsed]: Marshal's No. 4232. No. 11. United States District Court, District of Arizona. Citation. Filed June 17, 1913. Allan B. Jaynes, Clerk.

No. 2291. United States Circuit Court of Appeals for the Ninth Circuit. Original Citation on Appeal. Received Jul. 26, 1913. F. D. Monckton, Clerk. Filed Jul. 26, 1913. F. D. Monckton, Clerk U. S. Circuit Court of Appeals for the Ninth Circuit.

Citation on Appeal of Arizona Copper Co. (Original).]

In the United States District Court for the District of Arizona.

No. 12.

United States of America,—ss.

The President of the United States of America to The Mines and Smelter Supply Co., a Corporation.

You and each of you are hereby cited and admonished to appear in the United States *Circuit of* Appeals for the Ninth Judicial Circuit within thirty (30) days from the date of this writ, pursuant to the appeal duly obtained and filed in the Clerk's office of the United States District Court for the District of Arizona, wherein you are appellees and Arizona Copper Company is the appellant, to show cause, if any there be, why the order and decree in said appeal mentioned should not be reversed and corrected, and why speedy justice should not be done to the parties in that behalf, and to do and receive that may appertain to justice to be done in the premises.

WITNESS, The Honorable WM. W. MORROW, Judge United States Circuit Court of Appeals Presiding as judge of the United States District Court for the District of Arizona, this 15 day of May, 1913.

WM. W. MORROW,
Judge.

United States of America,
District of Colorado,—ss.

I hereby certify that I have duly executed the within writ as follows to wit:

As to The Mines and Smelter Supply Company by delivering to Albert H. Seep, personally, as the Vice-president of the said The Mines and Smelter Supply Company, a true copy of the within writ at Denver in said District on the 12th day of June, A. D. 1913.

Fees and costs: $2.00

D. C. BAILEY,
U. S. Marshal.
By E. B. Chadwick,
Deputy.

[Endorsed]: Marshal's No. 4233. No. 12. United States District Court, District of Arizona. Citation. Filed June 17, 1913. Allen B. Jaynes, Clerk.

No. 2291. United States Circuit Court of Appeals for the Ninth Circuit. Original Citation on Appeal. Received Jul. 26, 1913. F. D. Monckton, Clerk. Filed Jul. 26, 1913. F. D. Monckton, Clerk U. S. Circuit Court of Appeals for the Ninth Circuit.

[Endorsed]: No. 2291. United States Circuit Court of Appeals for the Ninth Circuit. Detroit Copper Mining Company of Arizona, a Corporation, Appellant, vs. The Mine and Smelter Supply Company, a Corporation, Appellee, and Arizona Copper Company, a Corporation, Appellant, vs. The Mine and Smelter Supply Company, a Corporation, Appellee. Transcript of Record. Upon Appeals from the United States District Court for the District of Arizona.

Received July 26, 1913.

F. D. MONCKTON,
Clerk.

Filed July 26, 1913.

F. D. MONCKTON,
Clerk of the United States Circuit Court of Appeals for the Ninth Circuit.

By Meredith Sawyer,
Deputy Clerk.